THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

It is still a waiting market, with the advantage generally in favor of the buyer. As long as specifications on existing contracts are good, the mills may be expected to be complacent while the market drifts. The test is yet to come. Meantime the United States Steel Corporation has canvassed the situation on its leading products, and in conjunction with other manufacturers of rails will probably make early announcement of the basis for 1904. Unless some unfavorable development not now in sight should intervene, the probabilities are that plates and structural material will remain at 1.60c at Pittsburg mill for 1904 business. The effect of strikes in cutting off consumption cannot now be measured; but the disposition of workmen in many lines and districts to carry wages still farther upward when the wave of prosperity is manifestly reflowing, is certain to bring complications. Statistically the iron trade is still in a strong position. Pig iron production is at record figures, and all the iron made is entering into consumption, while the present month is expected to bring the end of the importations apart from straggling lots. Some furnaces are facing prices for iron that on the higher basis for ore and coke, as compared with their contracts in the early part of 1903, leave them less leeway, and if the downward movement goes much farther some of these will be out of the reckoning. Foundrymen do not appear ready to take hold, as yet, and the price fixed by Southern furnaces has not attracted buying. Rumors of offers by an independent furnace at $14.50 at furnace for No. 2 foundry have already come out. The basis of foundry coke contracts for the second half is also now under discussion. In the Chicago district the leading consumer of foundry irons is inquiring for 20,000 tons, but is not willing to contract at present prices. It is probable that the relation between supply and demand must develop more clearly before much business is done. The possibility of a car and locomotive scarcity in central territory later in the season is not lost sight of, in spite of the seeming disappearance of that factor. Malleable Bessemer iron is being sought in lots of 2,000 to 5,000 tons by Western buyers. Consumers here and there find themselves with more pig iron than they need, and the offering of such iron through various channels has made it appear that there is more spot iron offered than there really is. There has been a sharp demand for Bessemer pig for early shipment, pointing to steel works being short, although they show no disposition to contract for fourth quarter, and very little disposition to take iron even for the full third quarter. Prompt Bessemer has receded during the week, and latest transactions have been on the basis of $19 to $19.15, Valley, for June and July iron. Even the steel corporation has taken a small lot for such delivery, at $19. Northern furnaces have reduced asking prices to $20 and $20.25, delivered Pittsburg, for No. 2 foundry, in recognition of the new Southern market, but consumers are not yet ready to take hold. There is a fair demand for prompt steel, with surprisingly little offered, billets for prompt shipment commanding $30 at mill, Pittsburg or Youngstown. Independent tin plate mills have been the largest buyers, but they have taken only a comparatively small tonnage. The effect of troubles in building trades all over the country is being felt in decreased specifications for plates and shapes, the premiums of last summer being entirely lacking. The tin plate market is exceedingly strong on account of very heavy canning operations, production to September 1 being certain of breaking all records. Bar iron shows considerable competition on a light demand. The Chicago basis is 1.70c and sales from Ohio mills are generally on that basis at mill.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, June 10.

The local market has been extremely quiet. There has been some buying of Bessemer pig, but only for early shipment, the total movement in the week being between 15,000 and 20,000 tons, at slightly lower prices than were obtained a week or two ago. There is little disposition to buy even as far ahead as September, and quotations for such deliveries are simply nominal. There has been no buying of Southern iron in this district since the new prices were officially recognized, and the only effect has been to slightly reduce the asking prices of Northern furnaces on foundry and forge, without inducing any business.

For two months the most serious menace to the finished steel trade has been the labor troubles in various parts of the country. How serious is this problem, and how unreasonable are some of the demands of labor, is shown by developments locally this week. Bricklayers and stonemasons have been at loggerheads for several weeks, the bricklayers demanding that the masons' union join the national body of building trades organizations, which the masons refuse to do, being satisfied with their own trade organization. Following numerous strikes of bricklayers on account of this refusal, the employers of Pittsburg and vicinity decided this week to unite their different organizations, and shut down all building work in the district, until the bricklayers and stonemasons settle their differences. How they settle them is of no concern to the employers; they merely await such a settlement that building operations may proceed. They have signed all the scales they have been asked to sign, and there is no question whatever at issue between them and their employes.

Nearly all finished steel lines have been affected by the labor situation in that specifications on contracts have been reduced as compared with a year ago, and new buying has been retarded. In plates and shapes local mills are provided for a few weeks with specifications, while in merchant bars they have less than they can handle.

Declining prices have had a serious sentimental effect in the iron and steel trade, consumers halting on the question of whether or not Wall Street is the barometer of trade, and taking what appears to be the safe side, in not buying except where absolutely forced to do so.

Pig Iron.—Sales of between 15,000 and 20,000 tons of

Bessemer and basic have been made in the past week, at from $19 to $19.15, Valley, or $19.85 to $20, Pittsburg. Only in exceptional cases have deliveries run through third quarter, and in such cases they begin with the current month, so that the condition has been clearly one of hand to mouth buying. We note even odd lots for immediate shipments sold at $19, Valley, and it is probable that lower than this has been done in exceptional cases, as several lots of second-hand Bessemer have been hawked about until the apparent offerings have been many times the real amount for sale. The steel corporation took a small lot of June-July iron at $19, Valley, after ineffectual efforts to buy from furnaces at a lower price. No Southern foundry or forge has been sold in this market. Northern forge and foundry are purely nominal, sales in the whole district aggregating possibly two or three thousand lots, and being surrounded by such special conditions as not to make a market. Northern furnaces have reduced asking prices to harmonize with the now recognized Southern market, and do not quote over $20.25, Pittsburg, for No. 2, and $19.50 to $19.75 for forge. No effort is being made to force sales, since consumers are explicit that they are not ready to buy. Foundries are fairly well covered, by various cross-sales, for a couple of months. Consumers of forge have used nearly all their iron, one consumer confessing to a furnaceman he was not provided for July, yet refusing to negotiate for iron. It is purely a question of how long furnaces are willing to wait without selling iron. We revise quotations as follows:

Bessemer, Valley	$19 00 to 19 15
Bessemer, Pittsburg	19 85 to 20 00
No. 1 Foundry	20 75 to 21 00
No. 2 Foundry	20 00 to 20 25
Gray Forge, Pittsburg	19 75 to 20 00
Chilled Basic, Valley	19 15 to 19 25
Chilled Basic, Pittsburg	20 00 to 20 10

Steel.—There is a surprisingly small quantity of crude steel offered, producers apparently feeling certain that unless they can get as large a profit, which they cannot, on the crude steel as on finished material, they had better hold it themselves. We note an active inquiry for small lots for early shipment, with but few consumers, and those mainly independent tin plate mills, willing to pay prices asked, $30 f. o. b. Pittsburg of Youngstown mill, for Bessemer billets. On long-time contracts lower prices would of course be made, but consumers are not interested. Open-hearth billets seem to be worth hardly as much as Bessemer, since the principal buyers have been tin plate mills, which prefer Bessemer. Tin plate is the strongest finished line on the list, the leading interest being sold up to September 1, throwing business to outside mills, at premiums, for early shipment, of from $4 to $5 a ton. We quote wire rods nominal at $37.

Ferro-Manganese.—Quotations are unchanged at $50 for large up to $52.50 for small lots, delivered, for 80 percent English ferro.

Muck Bar.—There is nothing doing in this market, mills quoting around $35, but $34.50 or lower could probably be done.

Skelp.—There is very little buying, although offerings are heavier. Some tentative quotations have been made in this market by Eastern mills, while a new Valley producer has also been offering skelp, but consumers are not ready to take hold, being provided for immediate requirements. We quote grooved iron skelp at 1.90c and sheared 2c, with grooved steel 1.95c and sheared 2.05c. It is probable that on a nice desirable order these prices could be shaded.

Rails and Track Material.—The market is quiet, rail production being sold for this year. There has been some talk among rail mills of opening books for next year's business, but it is improbable that this will be done, as such a move might fall flat with railroad shares being hammered in Wall Street. We quote: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 8 pounds, in carload lots, $39; less than carload lots, $40; 12 pounds, $38; 16 and 20 pounds, $36; 25 to 40 pounds, $36. Track materials: Spikes, 2.15c to 2.20c; track bolts, square heads, 2.05c; hexagon heads, 2.65c; fish plates, 1.60c on orders accompanying large rail contracts, otherwise 2c to 2.10c is asked.

Plates.—There are rumors of some troubles in regard to orders already placed for steel cars for late delivery, but these cannot be substantiated. Current specifications of car works for plates are fully up to the average, and orders from other consumers are also good, so that the plate trade is in comfortable shape, but there is no sign of the pressure which existed this time last year. Some of the local mills have turned down inquiries for small lots for early shipment, being well filled up, but the inquirers generally find a mill ready to take the business without a premium. Official prices are of course firmly maintained, and are not at all likely to be changed, as follows: Tank plates, ¼-inch thick and up to 100 inches in width, 1.66c at mill, Pittsburg; flange and boiler steel, 1.75c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates more than 100 inches, 5c extra 100 pounds. Plate 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots, with 5c extra a hundred pounds for less than carload lots. Terms, net cash, in 30 days.

Pipes and Tubes.—The movement in pipes and tubes is fully up to the capacity of mills and there is no sign of lower prices. We quote official prices as follows, in carload lots to consumers, f. o. b. Pittsburg, plus freight according to Tube Rate Book to destination:

MERCHANT PIPE.

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Wrought Iron Pipe. Black. Percent.	Wrought Iron Pipe. Galv. Percent.
⅛, ¼ and ⅜ inch	68	58	65	55
½ inch	70	60	67	57
¾ to 6 inch	75	65	72	62
7 to 12 inch	69	59	66	56
Plugged and Reamed				
1 to 4 inch	73	63	70	60
Cut 3 to 6 feet				
⅛, ¼ and ⅜ inch	63	52	60	49
½ inch	65	54	62	51
¾ to 6 inch	71	60	68	57
7 to 12 inch	65	53	61	50
Cut 6 feet and longer				
⅛, ¼ and ⅜ inch	64	53	61	50
½ inch	66	55	63	52
¾ to 6 inch	72	61	69	58
7 to 12 inch	66	54	62	51
Extra Strong Plain End				
⅛ to 8 inch	67	57	63	53
Threads only	66	56	62	52
Threads and Couplings	65	55	61	51
Double Extra Strong Plain End				
¼ to 8 inch	59	49	55	45
Threads only	58	48	54	44
Threads and Couplings	57	47	53	43

NOTE.—Orders for less than carload will be charged at 12½ percent advance. Extra and Double Extra Strong Cut Lengths, lower random discounts by 10 percent net for 6 feet and longer, and 15 percent net for 3 to 6 feet.

BOILER TUBES.

Steel.

	Percent.
1 to 1¼ inches	45
2¼ to 5 inches	62½
1¾ to 2¼ and 6 to 13 inches	52½

Iron.

	Percent.
1 to 1½ inches	36½
2¼ to 5 inches	45½
1¾ to 2¼ and 6 to 13 inches	35½

CASING.

	S. and S. Percent.
2 to to 3 inches	58
3¼ to 4 inches	60
4¼ to 12½ inches	63

Bars.—There is a fair amount of business going in steel bars, but the absence of large season contracts makes it necessary for mills to watch this business more closely than a year ago. Prices are firmly maintained on steel bars. In iron bars there is very little doing, and various prices are being made, which have tempted little business locally, as consumers are well covered. The total iron bar movement in third district has not aggregated over a hundred or two hundred tons a week for over a month. The price of 1.85c, Youngstown, quoted by the leading interest, is now purely nominal. At what price large business will ultimately be done is entirely a question for the future. Carloads are offered now and then at 1.80c, Pittsburg, and it is possible that lower than this has been done. We

quote prices as follows: Bessemer steel bars, 1.60c; open-hearth, 1.70c; plow beams and cultivator beams, 1.60c, net; channels, angles, zees and tees, Bessemer, under 3 inches, 1.70c; over 3 inches, 1.80c; bar iron, 1.80c, Youngstown, or 1.84¾c, Pittsburg, with freight added to point of delivery from Youngstown. Hoops and bands are quoted at 1.90c, full extras, in 250-ton lots and over, and 2c in less than 250-ton lots.

Structural Material.—The current movement in shapes is quite satisfactory, but there is a notable decrease in projects submitted to engineers for estimates. We quote official prices unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Sheets.—Official prices are firmly maintained on large lots, but carloads can also be had on same terms. Steel is so scarce that there is no chance for the naming of lower figures, which might otherwise be done. On contracts for 500-bundle lots and over we quote regular prices as follows: No. 28, 2.75c; No. 27, 2.65c; No. 26, 2.55c; Nos. 22 and 24, 2.45c; Nos. 18 and 20, 2.35c; Nos. 14 and 16, 2.25c; Nos. 10 and 12, 2.10c to 2.15c. Galvanized: No. 16, 2.60c; No. 18, 2.85c; No. 26, 3.35c; No. 27, 3.60c; No. 28, 3.85c; No. 29, 4.35c; No. 30, 4.50c.

Tin Plate.—Reports from all canning sections indicate an unprecedented pack. Each year the trade has looked forward to a good pack, and the disappointments of the past three years are not being duplicated. Demand is entirely for shipment within the next two months, but is so heavy that premiums of from 20 to 25 cents a box are freely paid. Production in the first eight months of this year will greatly surpass all records, and the year cannot help also breaking records, even should the expected lull occur later on, as may reasonably be expected.

Wire and Nails.—Wire products are decidedly slow, but there is no sign of lower prices, and the market can be quoted firm but quiet. Prices follow: Wire nails, carload lots, to jobbers, f. o. b. cars, Pittsburg, $2; plain wire, carload lots, $1.90; barb wire, carload lots, $2.30; staples, carload lots, $2.20. Galvanizing, 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel cut nails are quoted as follows: Carload lots, $2.15, and less than carload lots, $2.20, f. o. b. Pittsburg, plus freight to point of destination. Iron cut nails are $2.25 in carload lots and $2.30 in less than carload lots. Terms, 60 days, less 2 percent off in 10 days.

Merchant Steel.—Demand for cold rolled shafting is rather slow, owing to various troubles in machine shops. Tool steel is also rather quiet. Prices are unchanged, as follows: Turned cold rolled and ground shafting, 47 off in carload lots and 42 percent off in less than carload lots; tire steel, 2.15c to 2.25c; spring steel, 2.25c to 2.35c; toe calk, 2.30c to 2.40c. The following differentials maintain: Less than 2,000 pounds of a size and not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance. Tool steel is quoted 7 cents and upwards, according to the grade.

Spelter.—Spelter is a little firmer for June shipment, and we quote 5.63½c for June and 5.73½c for prompt.

Old Material.—There is no market, as the pig iron market must be settled before there is any large business in scrap. We quote heavy melting stock nominal at $20, and it is possible that crop ends would actually bring this figure.

Coke.—There is nothing doing in coke, prices being nominally about $3 for either spot or contract furnace coke. Production keeps up in the Connellsville region at a little over 300,000 tons a week.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, June 9.

The local market has gained a little strength by the change in pig iron quotations made last week by the Southern Furnace Association. As previously announced, the schedule adopted at this meeting is based on $15 Birmingham for the No. 2 foundry. It is too early as yet to determine what the foundrymen's attitude toward the market will be, but the impression prevails that a further reduction will be necessary before there will be a general buying movement. The fact that the large consuming interests are not satisfied with the cut made and have announced that they will not buy until prices are $1 to $2 a ton lower, will have a restraining influence on a majority of the smaller melters and a tendency to force prices downward. This market has practically been at $15 for some time, and instead of trailing after it, as the association has been doing, consumers had been led to hope that in this instance a reduction would be made low enough to bring in both the large and small interests. Independent furnaces are not by any means shut out by the action of the leading producers, and since their announcement offerings have been made by them at $14.50 for No. 2. There has been a moderately good buying of pig iron during the week, but not as heavy as was anticipated, melters covering only for requirements 60 to 90 days ahead. In finished iron and steel, most lines are quiet. Sheets, tubes and billets are exceptions. For each of these there is a good demand. The inability to procure foreign billets earlier than the last quarter of the year has resulted in a heavy inquiry on domestic mills, the aggregate tonnage being far greater than they can supply. The leading wire interest is suffering from the prevailing scarcity and to augment its supply orders have been given to start up the Hainsworth mills at Pittsburg on billets and sheet bars. Bar iron has weakened $1 a ton during the week, sales having been made on the basis of 1.70c Chicago. The slump in scrap is no doubt largely responsible for this, prices of old material still being on the downward grade. There is little demand from the agricultural trade, either for steel bars or merchant steel, and specifications of the former also show a falling off. A good inquiry has developed for heavy rails, but owing to the impossibility of getting deliveries before November and December, few sales are made. Plates and structural steel are quiet, though shipments can be made within 30 days.

Pig Iron.—The most noteworthy feature of this market is the fact that the largest consuming interest in the west is ready to buy 20,000 tons of No. 2 soft, with the probability of increasing it 20,000 to 30,000 tons additional if the price is right, the balance being divided among other grades. There has also been a heavy inquiry for malleable Bessemer, consumers asking prices on lots from 2,000 to 5,000 tons each. The tonnage represented in inquiries from all other sources is also very large, probably approximating 50,000 tons. Actual trading in the past week was not, however, in proportion to the volume of inquiry. Leading consumers are disappointed that the Southern Furnace Association did not reduce its prices to a lower basis than $15, and affirm they will not buy at this figure. Many of them have contracts running into the third quarter of the year, and these assert they are in no hurry to place their orders for the last half. Buying during the week has been only of moderate proportions, the preponderance of sales being to small melters for requirements in the next 60 to 90 days. Reports are current that independent furnaces are offering iron in this market on the basis of $14.50 for No. 2 foundry, and the unrest created by the action of these producers, together with the announcement of the large consumers, will result in a further postponement of the buying movement until July. We have revised our prices, and quote as follows:

Lake Superior charcoal	$23 00 to 24 00
Local Coke Foundry No. 1	20 80 to 21 30
Local Coke Foundry No. 2	20 30 to 20 80
Local Coke Foundry No. 3	19 80 to 20 30
Local Scotch Foundry No. 1	20 80 to 21 30
Southern Coke No. 1	19 85
Southern Coke No. 2	19 35
Southern Coke No. 3	18 85
Southern Coke No. 4	18 35
Southern No. 1 soft	19 85
Southern No. 2 soft	19 35
Southern Gray Forge	18 10
Southern Silveries (4% to 5% silicon)	20 60 to 21 10
Southern Silveries (5% to 6% silicon)	20 85 to 21 35

Jackson Co. Silveries (6% to 8% silicon)	25 30 to 26 30
Jackson Co. Silveries (8% to 10% silicon)	26 30 to 27 30
Ohio Strong Softeners	22 00 to 22 50
Alabama and Georgia Car Wheel	26 35 to 27 35
Malleable Bessemer	20 80 to 21 30
Basic iron	20 35 to 20 85

Bars.—Demand for both iron and steel bars continues weak, and there is sharp competition for the business offered. This has resulted in an order for 1,000 tons of iron being placed on the basis of 1.70c Chicago. It was a desirable order to work on, which no doubt influenced mills in shading prices to get it. Specifications from the agricultural trade are light, and some mills are hard pressed to secure enough business to keep running. The weakness in scrap and the reduction in prices of pig iron are responsible in a measure for the slight demand for bars, consumers waiting until the bottom is reached in the hope that prices for the finished material will get still lower. Producers are holding firm at the following quotations: On mill shipments, Chicago delivery, Bessemer steel, 1.76½c; angles, less than 3x3, 1.86½c base; hoops in lots of 250 tons and greater, 2.06½c; less than this amount, 2.16½c; iron, 1.70c to 1.75c. Quotations from store: Steel, 2c to 2.10c; iron, 2.10c to 2.15c; hoops, 2.40c to 2.50c; angles, 2.25c rates.

Sheets.—Demand is good for all gauges, and the leading producer is reported to be sold up for several weeks ahead. Store trade is active and prices are firm. We quote mill shipments, carload lots, Chicago delivery, as follows: Black sheets, No. 27, 2.86½c; No. 28, 2.96½c. Galvanized 75 and 5 percent. On lots from store, we quote: No. 27 black, 2.95c to 3c; No. 28, 3.05c to 3.10c. Galvanized 75 and 2½ percent to 75 percent.

Structural.—Demand continues quiet, with the exception of store trade. Jobbers are doing an active business in small lots. We quote mill prices, Chicago delivery: Beams and channels, 16 inches and under, 1.75c; 18 inches and over, 1.85c; universal plates, 1.75c; angles, 3x3 and larger, 1.75c; tees, 3x3 and larger, 1.80c; zees, 1.75c. Lots from store, 2¼c per pound.

Plates.—Orders have been placed with mills during the week aggregating 2,500 tons. Central Western mills report they can give deliveries within 30 days. Demand from jobbers is of good proportions. We quote mill prices, Chicago delivery, as follows: Tank steel, ¼-inch and heavier, 1.75c; flange steel, 1.85c. Prices for lots from stock: Tank steel, ¼-inch and heavier, 2.15c to 2.25c; 3-16, 2.25c to 2.35c; No. 8, 2.30c to 2.40c; No. 10, 2.35c to 2.45c; flange steel, 2.40c to 2.50c.

Rails and Track Supplies.—There has been a heavy inquiry for standard sections, but the crowded condition of mills, preventing them from making deliveries earlier than November or December, has postponed many deals. Local producers have booked a large tonnage on light rails, and are sold up for three months. Demand for track supplies is also very brisk. We quote standard sections, 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; second quality rails, $27; light rails, 45 pounds, $34 to $35; 12 pounds, $39 to $40; with regular differentials for intermediate sizes. Track supplies, mill shipments: Angle bars, 2c to 2.10c; spikes, first quality, 2.25c (out of store, carload lots, 2.35c to 2.45c rates); second quality, 2.10c; track bolts, 3½x¾, with square nuts, 2.85c to 3c per 100 pounds; with hexagon nuts, 3.05c to 3.15c, with usual differentials for other sizes.

Merchant Steel.—Buying continues light, though specifications are of a fair tonnage. We quote mill shipments, Chicago delivery, as follows: Spring steel, 2.65c to 2.75c; sleigh shoe, 1.95c flat sizes; concave and convex, 2c; out of store, 2.15c; cutter shoe, 2.50c to 2.60c; machinery steel, 2.15c to 2.25c base; plow steel, 2.50c and upwards, according to quality; toe calk, 2.30c to 2.40c; out of stock, 3c to 3.10c; ordinary tool steel, 6c to 7c; specials, 13c and upwards; less than carload lots, 5 and 10 percent higher; cold rolled shafting, carload lots, 47 percent off; less than carload lots, 42 percent off.

Merchant Pipe.—Demand for all sizes is very heavy, the sales of the leading producer being greatly in excess of those for the same period last year. We quote carload lots, mill shipments, random lengths, f.o.b. Chicago, as follows:

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛ to ¾ in. inclusive	66.35	56.35	63.35	53.35
½ inch	68.35	58.35	65.35	55.35
¾ to 6 inches	73.35	63.35	71.85	61.85
7 to 12 inches, inclusive	67.35	57.35	64.35	54.35

Less than carload lots, 12½ percent advance over above prices.

Boiler Tubes.—There is no diminution noted in the demand, and mills have no trouble in disposing of their product for several weeks ahead. Our quotations below are on carload lots, mill shipments, f.o.b. Chicago. On less than carload lots, 12½ percent is to be added:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	43.35	38.35
1¾ to 2½ in.	55.85	35.85
2¾ to 5 in.	60.85	45.85
6 to 13 in.	55.85	35.85

For lots direct from warehouse stock:

	L. W. Steel Percent.	C. C. Iron Percent.
1 to 1½ in.	40	35
1¾ to 2½ in.	50	32½
2¾ to 5 in.	57½	42½
6 to 13 in.	50	32½

Cast Iron Pipe.—Erie, Pa., is in the market for 1,200 to 1,500 tons of 60-inch pipe, and Sioux City, Ia., for 2,000 tons of all sizes. There is a good demand from the jobbing trade and other sources. We have lowered our prices, and quote f.o.b. Chicago, carload lots: Four-inch water pipe, $33; 6-inch, $32; 8-inch and upwards, $31; gas pipe $1 a ton higher. On large lots these prices can be shaded.

Billets and Wire Rods.—There is a heavy demand for domestic billets, which mills are wholly unable to meet, the total inquiry running into many thousands of tons. A Western consumer is also in the market for 3,500 tons of wire rods. We quote German basic Bessemer billets, $28.50 to $29 seaboard; domestic Bessemer billets, $32.80 Chicago; open hearth billets for rolling mill use, $31 to $31.50; for forging purposes, $34 to $36; wire rods, $39.50 to $40.

Wire and Wire Nails.—The usual summer falling off is being felt, though all the mills have their order books comfortably filled for several weeks ahead. The leading producer reports a scarcity in its supply of billets, and has ordered the Hainsworth mills at Pittsburg, which have been closed for some time, to be put in operation on billets and sheet bars. Our quotations to jobbers, Chicago delivery, are as follows: Wire nails, carload lots, $2.20; less than carload lots, $2.30. Cut nails, steel, carload lots, $2.26½; less than carload lots, $2.36½. Plain wire, $2.10 carloads, and $2.20 in smaller lots; galvanized, carloads, $2.40; smaller lots, $2.50. Barbed wire, carloads, $2.50; less than carloads, $2.60; galvanized, carloads, $2.80; less than carloads, $2.90. Staples, carloads, $2.30; smaller lots, $2.40; galvanized, carloads, $2.60; smaller lots, $2.70. Bale ties, 85 percent discount f.o.b. Waukegan on straight carload lots. Poultry netting, 85 and 5 percent discount from list f.o.b Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Coke.—Contracting for coke is not very brisk, though there is a good demand for spot shipment. There is so much material on track in this city, and of such a variety of grades, being offered at almost consumer's prices, that it is difficult to determine the market price. The best 72-hour Connellsville coke cannot be bought, however, at less than $4.25 to $4.50 at the ovens.

Old Material.—The market continues very weak, demand being reduced to a minimum. A further reduction in prices has been made in the last few days. We quote gross tons as follows:

Old iron rails	$21 00 to 21 50
Old steel rails (mixed lengths)	16 50 to 17 00
Old steel rails (long lengths)	19 50 to 20 00
Relaying rails	29 50 to 30 00
Old wheels	20 00 to 20 50
Heavy melting steel	15 50 to 16 00
Mixed country steel	11 50 to 12 00

The following are selling prices per net ton:

No. 1 R. R. wrought	$16 50 to 17 00
No. 2 R. R. wrought	14 50 to 15 00

Shafting	16 00 to 16 50
Dealers' forge No. 1	14 00 to 14 50
No. 1 busheling and wrought pipe	12 00 to 12 50
No. 1 cast	13 50 to 14 00
Heavy cast (300 pounds and over)	10 00 to 16 50
Railway malleable	14 50 to 15 00
Country malleable	13 00 to 13 50
Iron axles	21 50 to 22 00
Steel axles	17 00 to 17 50
Cast borings	5 50 to 6 00
Mixed borings, etc.	5 50 to 6 00
Wrought turnings	12 00 to 12 50
Machine shop turnings	12 00 to 12 50
Iron axle turnings	12 50 to 13 00
Steel axle turnings	12 00 to 12 50
Stove plate and light cast scrap	9 00 to 9 50
Old iron splice bars	16 00 to 16 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, June 10.

There has been some talk during the past week of sales of ore, but nothing of importance developed. It seems now impossible that the selling to outside districts should be as heavy as a year ago. In fact if the demands of the new productive capacity do not equal the shipments into other territories last year the movement down the lakes will not be as heavy this season as last. The report for May as given in these columns last week shows that the boats were very busy in that month, the increase over May, 1902, being 248,116 tons. The congestion of the boats at the docks is enormous because the ore trade is sustaining the burden of keeping the lake fleet employed. The rates are sagging and some talk of reducing the rates to 75 cents from the head of the lakes is indulged in with, however, no serious developments in that line to date.

Pig Iron.—The general cut of the Southern iron price brought out a little business in this territory. The Northern furnaces, having made a similar price, have also been able to place some foundry for second half, but not very much. The big general buying for the period after July 1 has not started. All Southern furnaces are now united on a quotation of $15 Birmingham for No. 2, the independents having accepted that price and being governed by it. Northern furnaces are selling No. 2 at $19 to $19.50, Valley furnace, the generality of sales being on the latter price. Some stacks are holding for $20, Valley furnace, for No. 2. Nothing more has been done in Bessemer, as the supply is pretty well sold up for the last half of the year, especially the Association material. The market has heard rumors of further sales by the independent furnaces at between $19 and $19.50, Valley furnace, but these reports have not been entirely verified. Basic producers are holding off until they are better able to judge production. Any quotation would be purely nominal and hardly even indicative. The talk is of $18.75 in the Valley. We continue to quote:

Bessemer	$19 00 to 20 00
No. 1 Strong Foundry	20 60 to 20 85
No. 2 Strong Foundry	19 85 to 20 35
No. 3 Foundry	19 35 to 19 60
Scotch No. 1	19 60 to 20 85
Scotch No. 2	19 85 to 20 35
Gray Forge, Valley	18 25 to 18 50
Lake Superior charcoal	24 00 to 25 00

Finished Material.—The market has been quiet all through, with some few grades showing better conditions, but in the main the dullness still pervading. The statement is permissible, however, that while the other cities have been reporting easier conditions Cleveland has been in better shape than they. Bar iron has been sagging in price and some of the mills have tried to come to the rescue and bolster up prices. The quotation now is almost general at 1.70c, Youngstown, with some sales being made at a lower price. The steel corporation is indifferent on this material. The trend is toward an identity between the prices of iron and steel. Bar steel is still quoted at 1.60c, Pittsburg, for Bessemer, with the usual difference for open-hearth. In structural one order of 2,000 tons would be specified against and duplicated in a new order if the labor conditions were at all favorable, but the contractors are unable to proceed and the market is dull in accordance, with deliveries being all that could be desired. The general price is 1.60c, Pittsburg, with jobbers getting some orders at 2.15c to 2.25c out of stock. Sheets have eased up a little and the demand is not quite so firm, but the market has not broken and the dealers are saying that there is no occasion for the quotation of any lower prices than have prevailed until now. The market is stable at the former list of prices. The announced prices of the principal producer for sales through jobbers are as follows: Galvanized sheets, mill sales, carload lots, Nos. 10 and 11, 2.60c; Nos. 12-14, 2.70c; Nos. 18 to 21, 3c; Nos. 22 to 24, 3.20c; Nos. 25 and 26, 3.55c; No. 27, 3.80c; No. 28, 4.05c; No. 29, 4.45c; No. 30, 4.95c. Galvanized sheets out of stock are quoted 75 and 5 off. For 3-16-inch black sheets and heavier we quote 2.15c, Cleveland. Mill sales of black sheets to consumers are made on the following basis: No. 24, 2.65c to 2.75c; No. 26, 2.75c to 2.85c; No. 27, 2.85c to 2.95. The following are prices out of stock: No. 10, 2.35c to 2.50c; No. 12, 2.45c to 2.60c; No. 14, 2.50c to 2.60c; No. 16, 2.60c to 2.70c; Nos. 18-20, 2.75c to 2.85c; Nos. 22-24, 2.85c to 2.95c; Nos. 25-26, 2.95c to 3.05c; No. 27, 3.05c to 3.15c; No. 28, 3.15c to 3.25c.

A few inquiries have been made for rails, but no business has developed, and it is questionable whether the mills would be able to meet the requirements because of the already crowded condition of the order books. The prices have been quoted as formerly, namely, $28, Pittsburg, for standard and $36, Pittsburg, for lighter rails. The call for billets has been heavy, but the supply is short and there is no immediate likelihood of any change in the situation.

Old Material.—The market continues dull, sales being confined largely to those made by dealers to dealers. These transactions indicate lower prices and we have revised our quotations as follows, f. o. b. Cleveland, gross tons:

Old iron rails	$23 00 to 24 00
Old steel rails (over 6 feet)	21 00 to 22 00
Old steel rails (6 feet and under)	20 00 to 20 50
Old car wheels	21 00 to 22 00
No. 1 R. R. wrought scrap	21 00 to 22 00
Mill scrap	18 00 to 19 00
No. 1 machine cast scrap	18 00 to 18 50
Iron axles	26 00 to 27 00
Steel axles	25 00 to 26 00
Axle turnings	16 00 to 17 00
Wrought turnings (free from cast)	15 00 to 16 00
Cast borings	9 00 to 9 50
Uncut wrought iron boilers	11 00 to 12 00
Steel boiler plates	17 00 to 18 00
Grate bars	13 00 to 14 00
Pipes and flues (clean)	17 00 to 18 00
Tank iron	16 00 to 17 00
Hoop and band iron	13 50 to 14 50
Sheet iron	12 00 to 13 00
Wrought drillings	14 50 to 15 50
Malleable iron (railroad)	19 00 to 20 00
Malleable iron (agricultural)	16 00 to 16 50
Stove plate	14 00 to 15 00
Heavy steel	18 50 to 19 50

CINCINNATI.

June 9.

Prices for coke continue somewhat irregular, but there are some indications of steadiness. Offerings are not being urged with so much eagerness. The ruling quotations are now $3.50 to $4.00 f.o.b. ovens for foundry coke, but the inside price is not quoted with frequency.

Pig Iron.—The first week of the new schedule of the association of Southern furnaces has not developed much business. Sales agents representing furnaces in the association have made some efforts to interest their customers, now that they can offer iron in line with prices quoted by the outside interests, but the buyer is still in a waiting mood. A little more iron has been sold than for the past two weeks, but there is no large business doing and orders are for car lots up to 200 tons. Buyers needing iron will not buy for more than sixty days ahead. Prices seem to be fairly steady and transactions are mainly at schedule figures, but the undertone to the market is easy and the dullness prevailing leads the trade in general to take a pessimistic view. There is talk of $14.50 Birmingham having been quoted for No. 2 foundry and $13.50 for gray forge, but nothing definite as to the actual naming of these prices is obtainable. On the other hand, some independent furnaces have declined to follow the market to the $15 basis, and it is asserted that so few furnaces would be willing to shade schedule figures that it will be only a short time before all bargain lots will be out of the way. Buyers are talking the market down. They say to the salesman that he must have some inducement to offer, as

the pick of the market is obtainable at schedule prices, and he backs up his position by refusing to purchase. The conditions are therefore by no means settled, and the new schedule promulgated in the hope of establishing a stable pig iron market has not yet clearly established the accomplishment of that purpose. Some fair transactions in basic iron have been consummated. Southern Ohio furnaces are quoting $18 to $18.50 f.o.b. furnace for No. 2 foundry. We quote the market for delivery f.o.b. Cincinnati:

Southern Foundry No. 1	$18 75
Southern Foundry No. 2	18 25
Southern Foundry No. 3	17 75
Southern Foundry No. 4	17 25
Southern Foundry No. 1 soft	18 75
Southern Foundry No. 2, soft	18 25
Gray Forge	17 00
Northern Foundry No. 1	20 15 to 20 65
Northern Foundry No. 2	19 15 to 19 65
Southern car wheel iron	25 75 to 26 75

Finished Material.—The demand is still confined to moderate sized orders, but these orders are fairly numerous, showing that buyers are covering only present needs. There is a steady tone to the market, but on the few large orders available there is considerable competition. Structural shapes are finding a good demand in a retail way and dealers report an improvement in this direction. Bars are steady, with car lots quotable at 1.80c base, half extras. Steel bars remain at 1.72c base half extras, with the retail price 2c base half extras for both out of store. Galvanized sheets are being quoted at 75 and 5 per cent off. We quote black sheets No. 27 at 2.78c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 3.10c; No. 27, 3.20c; No. 16, 2.65c; No. 14, 2.55c; No. 12, 2.45c; No. 10, 2.35c. Tank plates are firm and sell out of store at 2.15c for ¼-inch and 2.25c for 3-16-inch. Beams and channels are quoted at 2.15c to 2.25c from stock, and angles at 2.15c to 2.25c for base sizes.

In merchant pipe the market remains steady. Independent mills seem to be still filled up on orders, and the leading interests are taking most of the new business offering. It is intimated that an advance in the present schedule may be made before long, but there is nothing definite on this point. We quote:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼, ⅜ inch	66.7	56.7	63.7	53.7
½ inch	68.7	58.7	65.7	55.7
¾ to 6 inch, inclusive	73.7	63.7	70.7	60.7
7 to 12 inch, inclusive	67.7	57.7	64.7	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
1 to 1½ inch	41.2	35.2
1¾ to 2½ inch	54.2	34.2
2¾ to 5 inch	59.7	44.2
6 to 13 inch	54.2	34.2

Old Material.—The market continues dull and easy and nominal values are marked down about one dollar per ton on the week. Melters still refuse to purchase and buyers are timid about taking up the offerings. We quote:

Old No. 1 railroad wrought, net tons	$15 00 to 16 00
Cast machine and foundry, net tons	13 00 to 14 00
Old iron rails, gross tons	18 00 to 19 00
Old steel rails, gross tons	16 00 to 17 00
Old short lengths, gross tons	16 00 to 17 00
Old iron axles, net tons	19 00 to 20 00
Stove plate, net tons	8 00 to 9 00
Wrought turnings, net tons	9 00 to 10 00
Cast borings, net tons	6 00 to 7 00

PHILADELPHIA.

June 9.

There is little change in the market except that conditions are even more unsatisfactory than they were last week. Prices are frequently much below "official" quotations.

Pig Iron.—Buyers are absolutely indifferent in regard to contracting and are buying only what they must have for immediate use. There is a fair demand for small lots of spot. We quote: No. 1 X foundry, $21 to $21.50; No. 2 X foundry, $19.50 to $20.50; No. 2 plain, $19 to $19.50; gray forge, $18 to $18.50; Middlesboro, No. 3, $19 to $19.50; basic, $19 to $19.25; Middlesboro in cargo lots, $16.75 to $17.

Steel.—The market is extremely dull and prices are gradually easing off. Prompt deliveries would command about $31, but for shipments during the last half of the year considerably better might be done, but, as in other lines, buyers are inclined to hold off.

Finished Material.—Business is dull and prices are weak with nothing in sight likely to cause any change until after midsummer. Quotations are easy at about as follows for city and near-by deliveries: Plates—Small lots, 1.90c to 1.95c; carload lots, ¼-inch and thicker, 1.75c to 1.80c; universals, 1.80c; flange, 2c; marine, 2.10c to 2.15c; firebox, 2.20c to 2.25c. Bars—Prices for carloads are usually quoted at from 1.80c to 1.85c for refined iron and 1.70c to 1.75c for steel bars. Structural Material—Beams, angles or channels, ordinary sizes, 1.73½c to 1.80c for carload lots, with the usual addition for smaller quantities.

Old Material.—There is no improvement in any of the articles quoted herewith. Buyers are holding off and they are expecting to secure further reductions before they begin to place orders. The weakness in finished products compels economies somewhere, and consumers think that scrap should contribute its share in reductions. There is practically no market at the present time, so that prices are merely nominal. We quote: Old steel rails, $20.75 to $21.25; miscellaneous heavy steel scrap, $20.25 to $20.50; low phosphorus scrap, $28 to $29; old steel axles, $26 to $26.50; old iron axles, $27 to $29; old iron rails, $23 to $24; old car wheels, $22 to $23; choice scrap, R. R. No. 1 wrought, $22 to $22.50; country scrap, $19 to $20; machinery cast, $18.50 to $19.50; No. 2 light scrap (forge), $18 to $18.50; No. 2 light scrap (ordinary), $14 to $15; wrought turnings, $16 to $16.50; wrought turnings, choice heavy, $17 to $17.50; cast borings, $10.75 to $11.25; stove plate, $15 to $15.50.

NEW YORK.

OFFICE OF *The Iron Trade Review*.
ROOM 1909, No. 150 NASSAU ST. June 9.

Pig Iron.—The pig iron market in this vicinity during the past week was dull. It was thought that the schedule of prices recently adopted by the leading Southern furnaces would usher in a buying movement of some proportions, but the reverse has taken place. After a thorough canvass of their customers, sales agents here report an indisposition on the part of the former to contract for extended delivery. There has been some buying, but the tonnage has been very small, and represents only a meager portion of what foundrymen will need. Buyers expect still further reductions to be made, and are holding off in anticipation that they will come. Buyers are aware that their course exposes them to some risks, but are willing to assume these rather than provide for their requirements at present figures. They expect the independent furnaces to again pave the way for lower prices. The general opinion here is that no change will be noted in the market until July 1, up to which time the generality of foundrymen are supposed to be supplied. Shipments on old contracts are the best they have been in some time. The foreign iron market is without a single feature of interest, and the dullness which characterizes it could not possibly be more profound. It is said that contracts can be made much better in the open market than the price of warrants would indicate. New York prices are as follows: Northern, No. 1 X, $20 to $20.50; No. 2 X, $19 to $19.50; No. 2 plain, $18.75 to $19; Southern, No. 1 foundry, $19.50 to $19.75; Southern No. 2 foundry, $18.75 to $19.25; Southern, No. 3 foundry, $18.50 to $18.75; Southern, No. 4 foundry, $18 to $18.25.

Rails.—The situation continues good; and orders are coming in satisfactorily. Standard sections are still $28 at mill.

Billets.—Advices here are to the effect that the German mills are all sold up to September. Shipments can only be had for July and August delivery at the best. Prices are irregular, depending mainly on quantity and delivery.

German basic billets rule at from $27.50 to $28.50. Offerings of Canadian steel are said to have been made at some seaboard points, notably Philadelphia, but we hear of no sales.

Finished Iron and Steel.—The week has been extremely quiet in all departments of the finished material market, owing to the unsettled condition of the labor world. There is some excellent structural material business in sight, but the parties will make no engagements until the labor situation clears. Sheets and bars are inactive, but prices continue to be fairly well maintained. In plates some good contracts for extended delivery, but at reduced prices, have been closed. New York prices are as follows: Beams and channels, 15 inches and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.25c; sheared steel plates, tank, 2.10c to 2.15c; flange, 2.25c to 2.30c; firebox, 2.30c to 2.50c; refined iron bars, 1.85c to 2c; soft steel bars, 1.75c to 1.85c; steel sheets, in carloads, New York, No. 28, black, 2.90c to 3c; galvanized, 75 and 2½ off.

BIRMINGHAM, ALA.

June 9.

Some few orders have been booked at reduced prices, and the announcement is also made that two or three independent furnace companies have sold practically all their output to October 1, at prices ranging from $15.00 to $16.50, Birmingham, for 2 foundry. It would seem that the action of the associated furnaces in reducing prices a week ago simply put prices on the level that had already practically been reached. With present high costs, it seems certain that should prices of iron go as much as one dollar per ton lower, several Alabama furnaces would necessarily have to suspend operations until wages could be readjusted. Principal interest now centers upon the joint conference to be held between the United Mine Workers of this district (No. 20) and the Alabama coal operators, to be held the last week of this month. It is difficult to foreshadow the result. A year ago, when the present mining scale was agreed upon, iron was bringing about $1.00 per ton more than at present, with the market very active and advancing. With a declining iron market and very few transactions, it is not thought the coal miners can insist on a higher maximum figure than now being paid. Some of the operators, having no connection with furnace interests and marketing their entire output of coal, are urging that the sliding scale, based on the price of pig iron, be abolished altogether and that a price be fixed for the entire year. However, it is not thought the basis which has heretofore prevailed will be changed, as the miners seem to prefer the sliding scale, as well as those coal mining companies operating furnaces, which, of course, produce the bulk of the coal mined. It is rumored that the miners will insist upon a uniform eight-hour day and two weeks' pay-day.

Virginia coke is now being brought to Alabama and sold at prices ranging from $4.00 to $4.75 per ton f. o. b. cars Birmingham. This has necessarily made a corresponding reduction in the price of Alabama coke. The output of coal continues very heavy and large stocks have been accumulated by the different railroad interests, and by other consumers who can store a good supply of fuel, in anticipation of at least a two weeks' shutdown of the coal mines in July, pending the arrangement of new contract with the coal miners.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
Room 1909, No. 150 NASSAU ST., June 9.

Pig Tin.—On the whole the market during the week has been lower. During the past two days bearish interests succeeded in forcing values down, chiefly because of the receipt of adverse reports from leading consuming centers. New business is of limited propositions, and little interest is manifested in futures. London has been fairly strong during the week, and prices today are higher than since we last quoted them. The closing prices at the Metal Exchange today were as follows: Spot, 28c to 28¼c; June, 27⅞c to 28⅛c. London closed today as follows: Spot, £126 12s 6d; futures, £124. Arrivals at Atlantic ports for the month to date amount to 1,725 tons, with 2,635 tons afloat.

Copper.—The feature of the week was the reduction yesterday of ¼ cent per pound in the official price of Lake and electrolytic, and ⅛ cent in casting. The object sought was to induce large consumers to abandon their waiting policy, but its realization is still a debatable matter. The demand from the country is extremely slow, with nothing indicating an improvement in the immediate future. During the week the London market declined considerably. Closing prices at the Metal Exchange today were as follows: Lake and electrolytic, 14½c to 14¾c; casting, 14c. London closed today as follows: Spot, £56 5s; futures, £55 10s. Exports for the month to date aggregate 2,282 tons.

Lead.—Is dull, with prices inclining lower. Lots of 50 tons or more are still quoted at 4.37½, but a reduction is imminent. St. Louis is nominal at 4.15c, in consequence of the floods. London is £11 8s 9d.

Spelter.—Is extremely scarce, shipments being delayed on account of the floods. Spot is 6c nominal. St. Louis is 5.60c, and London £21.

Antimony.—Cookson's is weaker at 7½c; Hallett's is 7c, and other brands at 6⅝c.

Quicksilver.—Still quoted at $47.50 per flask of 76½ pounds in lots of 100 flasks. London unchanged at £8 2s 6d.

Nickel.—Is selling at 40c to 47c for large lots down to a ton, and 50c to 60c for smaller quantities.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1115 MONADNOCK BLOCK, June 9.

The metal market is strong in all its branches. Demand is good and prices are firm. There is no change in quotations, which are as follows: Lake copper, carload lots, Chicago delivery, 14¾ to 14⅞c; smaller quantities, 15c. Pig tin, 30c; pig lead, 4.30c in 50 to 100-ton lots, and 5¾ to 6c in lesser quantities; spelter, 5½c in carload lots, and 5¾c to 6c in lesser quantities; sheet zinc, 6¾c; antimony, 10¾c to 11c for Cookson's, and 9¾c for Hallett's. We quote old metals as follows: Copper wire, 12¼c; heavy copper, 12c; light copper, 11½c; heavy red brass, 12c; heavy yellow brass, 9c; light brass, 8c.

CONTINENTAL PLANT SOLD.

(Special Telegram.)

PITTSBURG, PA., June 10.—The Continental plant at Wheatland, Pa., has been sold to D. Leet Wilson, representing the Fort Pitt National and Fourth National Banks, of Pittsburg, for $40,500, which was $13,055 less than appraisement. The plant contains seventeen double puddling furnaces, three 24-inch universal plate and three high double 21-inch muck mills. It was formerly owned by the Wheatland Iron Co. and later leased by the South Sharon Steel Co., Ltd. Afterwards it was bought by the Continental Iron Co. and then passed to W. D. McKeefrey, trustee in bankruptcy, who operated it for a short time, after which creditors foreclosed and took possession. The present purchaser represents the most important of these creditors.

R. B. Mellon, recently elected director in the Standard Steel Car Co., Pittsburg, with a new car plant at Buler, Pa., has just been made vice president, which marks the end of the Schoens' interest in the management of the company.

It is reported that the Eleanor Iron & Steel Co., which recently built puddling plant and skelp mills, will now erect a small open-hearth steel plant also.

The Jones & Laughlin Steel Co., Pittsburg, has bought further land adjoining its by-product Coke Plant and Soho furnaces on the north side of the Monongahela river in Pittsburg city limits for $50,000.

Reports are that on account of slow ore movement earnings of the U. S. Steel Corporation for the second quarter may fall slightly below those of the same quarter of last year.

LAKE SUPERIOR IRON MINES.

The sale of the e½ of the s e ¼ of section 6, 57-20, on the Mesabi range, to parties represented by D. M. Philbin, manager of the eastern division of the Great Northern Road, took place this week. The option was taken under a showing of 1,500,000 tons of ore running better than 53 50 percent iron, and chiefly non-Bessemer, but the explorations made by the option holders doubled this quantity of ore. The price is a $40,000 bonus in cash and 10 cents royalty, additional to the 25 cents the State receives as fee holder. The State's minimum is 5,000 tons annually, while that to the original lessees, on their 10 cents a ton, is 100,000 tons a year. A year ago this property was not considered especially attractive, being considered rather remote, while it would not have been attractive, had the ore been shown, at any such price as is considered reasonable now.

It is stated that ore has been found at a point 6 miles south of Grand Rapids, on the Mississippi river, and that the Mesabi formation has been cut there. As to the truth of this assertion nothing can be learned. It would not be remarkable, however, if it were true but it would open a considerable district for prospectors that is now considered valueless.

Nearly 100 feet of reasonably fair ore has been cut by a drill in the n e of the n e of section 24, 57-22, Mesabi range, where J. P. Morrow and others have been at work some months. Mr. Morrow is taking other lands in the vicinity.

Explorations in section 21, 59-14, that were heralded as of great promise, some little time ago, have not proved up, and the land will probably be abandoned. The ore did not clean up, and presents characteristics similar to much of what is found in the same neighborhood.

Longyear Lake, covering about 160 acres in section 21, 58-20, part of which is in the ore-bearing formation, has been in controversy between the State and owners of adjoining shore rights. The State is now to give a lease for exploratory purpose, claiming it has the right, and operations may commence there shortly. It is not at all certain that ore exists under the lake. A series of holes along its south edge, sunk by Messrs. Congdon, Hartley, Longyear and Woolbridge, have shown nothing though quite deep, and there is no ore on its westerly side.

Messrs. Sweeney, Miller, Hartley and Crosby are exploring in sections 23 and 24, 57-22. They have some 4,000,000 tons in sight, of a reasonably fair grade and have four drills at work now. In 23 the ore exists under a heavy capping of chert, running from 75 to 125 feet thick. Their last hole went through 101 feet of this ferruginous chert before cutting into ore, but the ore is of better grade than most in that district. These are State lands, and will pay $1,000,000 to the school funds on what ore is now in sight.

Operations in the s ½ of the n e ¼ of section 22, 59-15, have been discontinued, no ore being found. On the adjoining forty scuth the n e of the s e, work is now under way, and a small tonnage has been shown. A large amount of work is under way in the vicinity of the Croxton mine, on the east side of T 58 R 20, but ore bodies being found there are small and may not prove up. Recent explorations on the Croxton have shown that to be a far larger mine than was first thought, the present tonnage being in excess of 6,000,000.

Three churn drills are claimed to be working on the so-called Highland "Range" but nothing has been found so far but dirt and boulders. Duluth assayers are besieged with samples of quartzite, diabase, and even gabbro and clay from this district, in which optimistic explorers hope there is sufficient iron to make a showing.

Preparations are being made at the Genesee mine to hoist ore through the new shaft. The ore from the workings is being taken out through the Tobin shaft with which the deposit is connected.

All the drills that had been shunk on the Western Vermillion range and on the Mesabi west of the Mississippi River by the Great Northern Railroad have been withdrawn, as hope of finding ore bodies there has been abandoned.

There has been considerable uneasiness of late in the vicinity of Crystal Falls on account of a number of miners being laid off, and it was feared that many might be idle. Superintendent Wall, of the Columbia mine, states that thirty men were recently laid off, because the management had decided to stop the exploratory work. It is understood that the ore mining of the Columbia is to be carried out as long as there is a pound of ore to be taken out. At the Mansfield stoping has been suspended and only the development work kept up. This necessitated the laying off of about fifty men, but this is stated to be only temporary. To balance these reductions the Armenia has resumed on a small scale and the Bristol is offering employment to an increased number of men.

Operations at the Jack Pot mine on the Gogebic range are believed to be approaching a final close, it being expected that within a few months all work will be finished. The Jack Pot is owned by the Jones & Laughlin Steel Co. and has been the scene of much exploring for many years. The first ore was mined in 1892, when 3,944 tons were taken out. No ore was mined in 1894, 1895, 1896, 1898 and 1899 and only 102 tons last year. The total amount mined to the close of 1902 was 61,843 tons.

The Hanging Rock Region.

IRONTON, O., June 8.—During the past week there have been fruitless conferences between representatives of the Amalgamated Association and the officials of the steel mills at Ashland, Ky., with a view of settling the dispute arising from refusal to recognize the union, but there seems to be no prospect of an early settlement. The nail and wire mills here and at Ashland continue idle.

The Ironton Disc Plow Co. will be incorporated under the laws of Ohio by W. S. Reynolds, of Chattanooga; C. M. Humes, of Newark; J. L. Anderson and others, of Ironton. The capital is $100,000 and the company will locate here. Organization will be effected later in the week. C. M. Humes will have charge of the sales department.

The Business Men's Club has been advised that one of the largest concerns in New England, maker of harness hardware, is desirous of locating in this section if given a bonus of 20 acres of land.

The belief that the Republic Iron & Steel Co. is to abandon its Eagle plant here has induced a large independent rolling mill in the Middle West to suggest that it will come here it proper inducements are offered. The plant employs 500 men and has a weekly payroll of $50,000.

The Lawrence Furnace Co., at Culbertson, has posted notice of a reduction of 15 percent in wages. The employes are organized and it is probable that the reduction will be opposed.

The extension just finished from Ironton to Wellston by the Detroit Southern, completing a through line from the lakes to the Ohio River, is expected to be an important factor in the equalization of freight rates on ore to the furnaces in this section, as the C. H. & D., now surveying a route into Ironton, will make a competing line.

In a recent letter, your correspondent mentioned the overtures for the purchase of the railroad, furnaces and mineral lands of the Ashland Coal & Iron Co., at Ashland, Ky., coming presumably from either the Detroit Southern or C. H. & D. and Rogers, Brown & Co., of Cincinnati. On June 2, Col. Robert Peebles brought action in the Circuit Court of Boyd county, Ky., to enjoin the sale of the railroad and to prevent the company from opening its stock books. In the petition, Col. Peebles affirms that he has secured control of the majority of the stock and it seems that the minority is not in accord with his plans for a disposition of the property, which is said to be worth at least $2,000,000. The injunction will be a temporary bar to proceedings.

The month of May was a record breaker in volume of traffic through the great ship canals at Sault Ste. Marie, the total of 5,188,017 tons of freight having been carried through. This is the greatest for any single month in the history of the canal. It is 762,358 tons in excess of the corresponding month last year and, with the April traffic included, the season to date shows 74,963 tons in excess of same period last year.

The Smith Boiler Works, now of Port Huron, Mich., will be moved to Toledo, O. The plant employs about 50 men.

THE IRON TRADE REVIEW

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JUNE 11, 1903

THE FOUNDRY ASSOCIATION ADVANCE.

The American Foundrymen's Association and its capable secretary are to be congratulated upon its status as shown by the reports presented at the Milwaukee convention this week. The association has accomplished already far more that is of permanent value to the foundry trade than the most optimistic advocates of the association idea would have predicted two or three years ago, and its usefulness is far from reaching its limit. From being commonly reckoned as an organization, whose chief activities were connected with the annual meeting, and these very largely of a social character, the association has been making marked progress as a medium through which cast iron is being intelligently studied and the problems of melting and molding brought farther on toward a solution. There have been times when those largely responsible for the reputation the American Foundrymen's Association has won as a working organization have had reason to feel that the foundrymen of the country were little responsive to their efforts, and it is possible that the prominence given metallurgical questions that were over the heads of the average convention audience had something to do with the attitude of many.

Dr. Moldenke's administration of the secretary's office is to be credited with admirable persistence and faith in the ultimate appreciation of the time and labor so freely expended. While far from being what it should be, the financial exhibit at the Milwaukee convention is the best in the association's history. Its journal now goes to many foreign investigators in the field of cast iron and its members and subscribers number 317. In the past year a step has been taken that promises an enlargement of influence, in the organization of the metallurgical section and the separate section for foundry foremen—the former for the study of pig iron and cast iron, and particularly questions relating to chemistry, heat treatment, testing and the making of mixtures, while the foremen's section will devote itself to foundry equipment and practice, the cupola and the molding floor. Wages and prices for product have never entered into the councils of the association; but the general question of the relation of employer and employe has been incidentally involved in some of its work, and very naturally in a review of such a year as that just ending President Walker touches on what in the minds of many is the uppermost feature. Similarly Mr. Carnegie in his inaugural address as president of the Iron and Steel Institute laid much stress on the reward of the workman and the best method of securing for him an equitable share in the profits of industry. President Walker's comments on this subject are eminently judicial and temperate and breathe a reasonable and optimistic spirit.

Whether gauged by the reports of the association's activities in the past year or by the excellent program of papers at Milwaukee, the convention of this week plainly represents high water mark for the American Foundrymen's Association, and there are good indications of a new high record for the year to come.

THE OUTLOOK IN THE ORE TRADE.

A good many of the best men in the business, among iron ore mining and selling companies, are figuring that Lake Superior ore movement this year will not exceed, if it equals, that of 1902. There are many causes that seem to indicate a lessened business. Strikes and unsettled conditions among consuming interests are among them; but perhaps more potent is the fact that conservative steel makers are not going to buy ore ahead of requirements, as they did last year, when the fixing of higher prices for Lake Superior ores has been followed by a receding movement in pig iron prices. One cannot receive 25 percent excess over requirements very long without having an unwieldy furnace stockpile, and one is not apt to bring down more than needed when he thinks that by another spring he can get it for less price. There is little buying of Mesabi Bessemers, though plenty of non-Bessemers of that range are going off. There was too great a difference between prices of the two grades compared with the slight chemical divergence.

Mesabi non-Bessemers, at present price, mixed with old range low phosphorus ores, come out of the furnace an all-Bessemer pig at minimum cost. Some large independent interests, that a year or two ago made heavy long-time contracts for the delivery of a guaranteed 64 percent low-phosphorus Mesabi ore at $2.75 Cleveland, are shipping heavily, and quite naturally so; and the steel corporation is getting out its ore, especially from stockpiles, as fast as possible. Lake freights are low and there may be a revival in the fall, in which case shippers consider it is well to have as much of requirements down early as possible. Some underground mines are laying off a few men, some are cutting the night shift, and some steam shovel properties are reducing their output. This is believed to be temporary. Many Bessemer mines have sold only about 50 to 75 percent of their expectations and are ready for an increased demand. There are some 35 Mesabi mines, either new this year or were opened in a sort of preliminary way last year, and made initial shipments. These are all ready to ship largely, those of last year at once and those of this year either now or later in the season. Other new Mesabi mines, that were

expected to be open this year, will scarcely get around to make delivery of any ore, and it is probably just as well that they cannot. Every facility has been furnished for a very much heavier ore movement than ever before, both by lake and rail transportation, by loading and unloading devices on the docks, and by preparations at the mines; and if there shall be a revival of demand for any class of ore later in the season it will be easier to fill it than it has even been in the past, though it is probable that some mixtures and grades may suffer if purchases are left too long. The increase of facilities of all kinds is on a scale that is scarcely realized, and it would be an easy matter to make lower lake delivery of 33 to 35 million tons this year, if it could be handled away from the docks and if there was demand for it.

The Labor Situation.

CONFERENCE ON "TIN HOUSE" SCALE.

The conference on the "tin house" scale was begun in Pittsburg Tuesday morning of this week between representatives of the American Tin Plate Co. and the Tin Plate Workers' International Protective Association. The conferees are the district managers of the tin plate company and the conference committee of the workers' organization. While the scale was originally only on the tin house labor proper, the organization has grown so that it now extends to certain branches of work in the mill proper. The present scale expires July 15, being set 15 days later than the Amalgamated Association scale, covering the hot mill labor, in order to permit of finishing the product of the hot mill before the tin house scale expires by limitation.

The demands of the two sides are almost entirely on the line of evening up prices for work with various styles of equipment, there being no demand for either a general advance or a general reduction. When the workers' organization first treated with the manufacturers, four years ago, rates of wages in different plants and with different equipment were very unequally balanced, and it has taken a great deal of changing to bring them to a logical basis.

NON-UNION CONVENTION CALLED.

Members of the non-union organizations of Muncie, Anderson and other Indiana cities held a meeting at Indianapolis June 4 for the purpose of calling a national convention of laboring men and employers of labor who are opposed to unions, and it was determined to hold the convention in Indiana in July. It was stated by some of the members that they had been in correspondence with the officers of non-union organizations at Syracuse, Albany and Utica, and that there is a very strong ground for a national organization of employers and employes, in order that policies may be adopted that would apply in all States. The representatives of the Indiana organizations were all favorable to an amalgamation of non-union organizations, and the proposed holding of a national convention is designed to bring this about. The reports from the organizations represented at the meeting showed that the non-union organizations in Indiana have enrolled many of the most conservative union men in their membership, and in two or three cases unions have come to them in a body, thus abandoning the union with which they had been affiliated for years.

U. P. MACHINISTS' STRIKE ENDED.

The machinists' strike on the Union Pacific system, which had continued for more than eleven months, was settled June 4 at a conference between President Burt, of the railroad company, and representatives of the strikers, and the 1,000 men who have been on strike returned to work last Monday morning. The settlement is regarded as a concession by both sides to the controversy. The terms of settlement follow:

Piece work shall be abolished entirely from the machine shops;

Every striking machinist shall be reinstated upon his own application within sixty days;

An increase of 7 percent in wages over those prevailing when the strike began, shall be given;

Nine hours shall constitute a day's work;

The company retains such of its present force of non-union men as it desires, on equal terms with the old employes and gives notices to them that all hotels within the shops will be closed at the end of two weeks.

The strike was declared off and work resumed at these points: Council Bluffs, Omaha, Columbus, Grand Island, North Platte, Cheyenne, Rawlins, Green River, Evanston, Ogden, Denver, Cheyenne Wells, Ellis, Junction City, and Kansas City.

LABOR NOTES.

Repeated efforts to arbitrate the strike of the workmen doing structural work at the Colorado Fuel & Iron Co.'s works, Pueblo, Cal., have failed. There now seems to be no prospect of an early settlement.

The molders of the Penn Steel Casting Co., Chester, Pa., after being idle for about five weeks, returned to work June 1. This practically ends the strike of the molders in that city, as the employers of the Chester Steel Casting Co. accepted the terms offered by the management, and returned to work a couple of weeks ago.

About 200 sheet metal workers of Cincinnati are on a strike, having made a demand for an advance of 50 cents a day and a reduction of time to eight hours. The employers have offered an advance of 5 per cent for the present year and 5 per cent for next year. They also desired a system of arbitration to eliminate the sympathetic strike. The men refused this.

The boilermakers in every contract shop in Milwaukee are on strike demanding a nine-hour day, recognition of the union and a minimum wage scale of $2.75 per day.

The strike of the sheet metal workers of St. Paul has been ended. The 120 men who went out May 1 have returned to work. Slight concessions were made to the men.

The marine machinists affiliated with the International Amalgamated Machinists' Union, Brooklyn, N. Y., have made demands for a minimum wage scale of $3 per day, an eight-hour day for outside work and a nine-hour day for inside work. At the Morse Iron Works these demands were refused and about 75 men quit work. The other companies in Brooklyn acceded to the demands of the men.

Work has been stopped on the twenty-story hotel structure which the General Building Construction Co. is erecting at Fifth Ave. and Fifty-fifth St., New York City. Ironworkers, engineers and helpers went on strike under the orders of walking delegates representing the Bridgemen and Housesmiths' Union and the Engineers' Union, their ostensible grievance being that Levering & Garrigues, contractors for the structural steel work, were delivering material upon trucks driven by non-union drivers. Mr. Garrigues says that this action repudiates an agreement recently entered into by virtue of which the men received an advance of 12½ percent in their wages. Some of the steel workers were indignant at being compelled to quit work.

Many of the molders' helpers who were on strike at Newark, N. J., returned to work in the foundries June 1, and the various companies state that the strike is practically over. The foundrymen have made no concession.

The manufacturers in Martin's Ferry, Bridgeport, Bellaire and other southeastern Ohio towns have made a demand for a nine-hour day, a minimum rate of wages of 35 cents per hour and a recognition of the union.

About two-fifths of the stack of the Struthers Furnace Co., at Struthers, O., has been relined and the furnace was blown in June 10, after being out of blast only 20 days. A new Otis hoisting engine has been installed.

Milwaukee Convention of the American Foundrymen's Association.

(Special Telegram.)

MILWAUKEE, WIS., June 9—The eighth annual convention of the American Foundrymen's Association began its sessions in the club room of the Pfister Hotel this morning with a registration of about 200, including a number of ladies who attended the first session, remaining through the address of welcome and the reading of the officers' reports. The president, Arthur W. Walker, of the Walker & Pratt Mfg. Co., Boston, called the convention to order, and introduced W. J. Turner, vice president of the Western Malleable & Grey Iron Mfg. Co. After welcoming the visitors on behalf of the Milwaukee foundrymen, Judge Turner presented Mayor Rose, of Milwaukee. The latter warmly greeted the visitors and extended to them the hospitality which has made Milwaukee a bright convention spot. He indicated some of the things which Milwaukee was always free to offer her guests, and the memory of which he hoped would linger pleasantly with the foundrymen.

Willis Brown, president of the Walker Foundry Co., Erie, Pa., responded to the welcome and pledged the visitors hearty participation in any program their entertainers had on foot.

Address of the President.

President Walker then read his address, which we present below in full:

The close of another year brings us again to a statement of the conditions and affairs of our association, and the general conditions and outlook of the trade. The most important change within the association during the year is the establishment of a section for foundry foremen, and also a section for foundry metallurgists. The former was created in response to a request from the association of foundry foremen now existing, who desired to affiliate with us, from an educational standpoint, which is theirs also. The negotiations which were authorized at the convention in Boston were afterwards concluded and were quite simple in character. It was shown by the constitution of the Foundry Foremen's Association that their object was purely one of mutual benefit through educational method. Your executive board therefore placed them upon the same basis as the local foundrymen's associations now affiliated with us, as to annual dues. It was further agreed, inasmuch as the volume of the convention business warranted its subdivision into sections, that questions and papers relating to the practical operation of the foundry be delegated to the foremen's section, they having charge of one session of the convention for this purpose. A chairman and secretary were appointed to carry this out efficiently. Similar action was taken with respect to the metallurgical questions now so frequently arising. A section for foundry metallurgists, authorized by the association at its last convention, has been duly established, and a chairman and secretary appointed.

By subdivision of the work in this manner, and the appointment of officers for the sections, it is intended to enlarge the usefulness of the association, as well as give members attending the convention an opportunity to select those subjects most interesting to them. It was agreed that all matters coming up at the sections, as well as in the associations affiliated with us, would be published in our journal, if of interest to the association at large. It is further agreed, in view of the demand generally expressed, that steps be taken to organize sections for pattern foremen, and for foundry accountants, both of these branches of office and work management offering lines of standardization which would be of marked value to the industry in effecting economies.

Something might be done for our apprentices in the way of education in their trade, when they cannot avail themselves of schools or correspondence schools. If it were possible for foundrymen to obtain short instruction papers from our association on subjects related to their work, for distribution among apprentices and men, it is probable that interest would be created; and many of the younger men could enter the present correspondence schools or the hoped-for school for molders. The members of the association might receive great benefit from such a course.

Regarding the condition of the trade from a business point of view, we have passed through a year of extremely high values. No one can be sure whether this period will long continue. Prices for coke appear to have receded permanently, and values of pig iron are somewhat lower, with a tendency slightly downward. We have passed through the difficulties of a rapidly rising market. I hope we shall not experience the trials of a rapidly falling market, which is, in my belief, even more difficult for the manufacturer. It requires high ability to manage a business with satisfactory profit while prices are falling. I suppose we would all prefer that, a high level as to costs having been reached, present conditions might continue indefinitely. Let us then hope that such may be the case, but it does not seem possible that such hopes will be realized. Perhaps the best we can expect is that the fall in values may be uniformly distributed over a long period.

I believe it appropriate also to refer to our relations to those employed by us, commonly known as the "labor problem." This subject is prominent in many foundries, and will require our best thought and judgment for some time to come. I will speak briefly of the lines which have been thus far followed in its development. Since the close of the civil war, the wonderful growth of manufacturing industries has brought into prominence the various labor unions. They have been the natural result of existing conditions. Inexperienced and crude in organization and method, the unions at first made demands which could not be granted without a struggle. Strikes were therefore frequent, some of them serious, many of them unjustifiable, and for a number of them the blame might be placed upon the employers.

From these earlier methods of dealing with labor, we have developed the condition of the present, which may be described as one of better organization on both sides. Some of the unions have become national in extent. Many employers are also affiliated, in associations for united action and defense. Each side has a large fund to give support to any course it may determine upon. Such reserve power tends to make both sides reasonable. We have gained in experience, and better understand the fair and equitable settlement of business problems by the application of common sense. In our industry this is the state of things today. Many prominent employers believe we have attained the ideal relation between capital and labor. We have certainly improved upon earlier conditions, and yet, from a certain point of view, these present methods are but a step forward and do not reach the final ideal. We may therefore expect to modify or abandon them later.

The present situation in our trade—a powerful labor organization on one side, and no less powerful associations for defense on the other—is similar to that of the nations of the world, with respect to their naval armament. As strong navies are a guarantee of continued peace, so large and constantly increasing funds available for instant use by these strong organizations may insure industrial quiet. But great military and naval strength, while doubtless the most practicable peacemaker now, will in some period be obsolete for that purpose. As the increasing effectiveness of modern weapons makes war absurd, unreasonable, and finally impossible, so large reserve funds may in time cease to be the chief reliance in dealing with labor.

If, then, our present ways of dealing with this subject seem to fall short of the ideal, what methods will in time

replace them? We cannot expect past or present notions to suit the new and ever-broadening future, in this or in any other department of our business. I do not assume to have the gift of prophecy, nor to be more enlightened than other men, but I beg to offer a few suggestions which may indicate the probable future trend of thought and action in dealing with the labor problem.

In the first place, then, we must have the same common sense and progressive spirit in handling labor as in the development of new processes. We cannot expect present methods of manufacture to continue long, neither can we hope that the present manner of dealing with labor will remain satisfactory during the next ten or twenty years. Neither can we expect in this country to withhold permanently from our workmen a fair proportion of income from manufacturing enterprises. Nor can we hope to crush labor unions; nor by large defense funds to settle finally the economic questions involved. The manufacturer who is wisely building for the future will study to work with his employes rather than against them; to please them; to unite his managing ability with their muscle and skill. If new methods of dealing with labor problems are to be in this direction, it may require a change of heart on the part of many.

The health and comfort of workmen in the shop is a matter so old it is hardly necessary to refer to it. We cannot expect a workman who is uncomfortable, and trying to perform a difficult operation without sufficient light, or air, or adequate appliances, to be in a frame of mind suitable for working wholly in his employer's interest. For some, therefore, a first step in the establishment of cordial relations between employer and workmen may be to study the comfort and convenience of employes. This is, however, only the first step; others will be clear to any employer who approaches the subject with an honest desire to do what he can.

We shall come to understand in the future that a manufacturer should be willing to pay the highest wages that the state of his industry will permit. His workmen are his partners; why should their welfare not concern him even more than that of his customers?

It may be well to inform employes relative to the business details of any enterprise. When a factory is busy they suspect enormous profits. They do not understand nor consider the relation of cost to selling prices. They cannot know whether orders are filled at a loss, were various expenses considered. If such information could be given it would make men more reasonable in their requests. An easily-raised objection is the tendency of such a course to advance wages in prosperous times; but the liberal-minded manufacturer will not object to this. When dull times return the men must expect the inevitable reduction of wages; if they are entirely satisfied that they are based upon the true state of the business, they will accept such reductions with content. The manufacturer must be honest with his men, and his men will be honest and fair with him. The American mechanic wants to be treated squarely. If he is sure of this, he is willing to share with his employer the burden of dull times. I am not saying that the earnings of the men should be in direct proportion to the profits of the employer; but earnings do and should bear some relation to profits. Many contests have arisen over this matter, some due to insufficient information, or an unreasonable concealment of real conditions by the employer.

I believe in the good sense and fair intent of any body of American mechanics when they are squarely met in an honest, straightforward and businesslike manner on any question with which they can be made familiar, and questions of market conditions, costs, selling expenses and profit are not complicated, although they may be made to appear so. They can be stripped of all complications, and any employer who is fit to continue in business can present them to his workmen in a form easily understood. If we would give as much time and thought to informing and educating our employes as we now spend in trying to please our customers, the effect would, I think, be helpful.

Sometimes an employer may go so far in prosperous times as to distribute a portion of his profits among his men. But it is not entirely a question of money with the American mechanic. The rapid development of business has separated him from his former contact with his employer; his imperfect notion of profits and similar matters has made him discontented.

The professional labor agitator is a logical product of the time; employers should make him unnecessary, and we shall hear no more of him. There is a reasonable and proper place for the real labor leader; one who by nature and education is fitted to counsel, advise and conciliate; who is honest, sincere, and always fair; who understands business and the position of business men. This ideal labor leader, as I have described him, is a more highly idealized product of civilization than the average employer of the present time. It is expecting too much that he should materialize at once; but in time he should appear, and I believe will do so. Employers should first themselves show him the pattern in the conduct of their own business. Neither the laboring man nor his representative can be expected to advance in these matters until employers have advanced first.

I believe that there are manufacturers who are studying closely this way of dealing with labor, and are making progress along these general lines. They are not saying very much about it, and are not quite sure whether they can make a success of it. Some of them will doubtless fail to reach their ideal, and all of them will be disappointed at times; but in this, as in other matters, no honest and earnest method entirely fails. All of us who deal with employes must expect frequently to be misunderstood and possibly abused for trying to get into closer relations with them. It must also be admitted that some of our theories and attempts in this direction have been mistakes.

It seems to me almost, if not quite true, that the manufacturers who will achieve the highest development and success during the next ten or twenty years will be those who recognize the present conditions as temporary and put themselves in line for permanent harmonious and cordial relations with the men who are doing for them in factory or foundry the work which they themselves would do if the size of their enterprise would permit.

With a face turned toward the bright future, and a heart full of hope, I look for that new and enlightened relationship upon which we may soon enter; a better feeling between employer and employe, a relationship most cordial, a spirit of mutual helpfulness; the prevalence of common sense and mutual forbearance. The manufacturer with a hundred or a thousand men associated with him in the production of any kind of goods, all working harmoniously together, with intelligent united effort, and with a sincere desire of all—the owner, the lowest workman, and all the men between—to bear a full share of responsibility, and put forth the greatest effort for the common good, is an industrial combination which will stand against the world.

Report of the Secretary.

The secretary, Dr. Richard Moldenke, presented his report as follows:

It will be generally conceded that the supreme rush in our business is now over. The high point has been passed, but we have yet before us a period of steady production at fair prices. It is but natural that the coming few years will bring forth many changes in methods of running our foundries, and this feeling has been very freely reflected from the general correspondence of this office. A marked interest is taken in "continuous running" of foundries, information has been called for, advice wanted, the pros and cons argued out, all of which shows that the running of foundries night and day, and pouring continuously, may not be so far off as is sometimes imagined. It is realized that while our foundries are now able to handle the work offered them, and that for some time to come they will probably be run below their full capacity, yet that when the next great wave of prosperity arrives, the question will rather be one of utilizing the plant capacity to the utmost, than making enlargements. It will therefore be well to ventilate this question of continuous running very

thoroughly, and thus in a way prepare our membership with the necessary information in good time.

It is further generally conceded that only in educating our present and coming labor will we overcome the evils that are steadily growing and hampering the fullest development of the industry. We need better apprentices and more of them, better informed molders, and more of them; better machine hands, better pattern-makers, better core-makers, better foremen, in fact we want highly paid and valuable specialists, so to speak, in every corner of the foundry. In this way we will increase the net gain for the yearly turn-over, and not only produce better work, but make life more worth living.

To do this we must begin at the bottom. We must furnish the apprentice the means to acquire the information that is to be the foundation of his life work. The correspondence schools are doing excellent work in this direction, but not every boy can avail himself of this opportunity. How many of our boys in the foundry and girls in the core room must help to support the family, and cannot therefore acquire an education, even if they desired it. Then again, it is far better that the foreman, who must be a natural teacher to be of full value to his employers, give the apprentice his first rudiments of the molding art. After this, and when the boy may be earning better wages, the correspondence schools will be valuable adjuncts in his career.

I would therefore recommend that short and elementary instruction papers be prepared under the direction of a special committee, and issued by this association to our foundrymen at cost, for distribution among the employes in the foundry. The information thus disseminated would prove valuable in time. I saw an instance of this nature this winter, which demonstrated the good that can come from such effort. Apprentices, molders, and even clerks from the office eagerly absorbed the information thus given by the foreman of a large foundry in the East. Not a Sunday, on which important repairs were made, passed without finding the students all engaged in noting cupola and other repairs, and lending a hand just for the experience it taught them, not to speak of the alertness of every one to note mistakes that might be made by the men in the ordinary shop routine. Here was an ideal situation. A corps of men that could be drawn upon, and depended upon, in emergencies, and all willing to assist the company as part of their system of education. I may add that every one of these students is striving to become at least a foreman. Were every foundry thus constituted, we would not hear of strikes, and ordinary business capacity on the part of the management would not find it difficult to keep the shop full at all times, even at the expense of the rest of the world.

The third point I desire to bring up is the recommendation of our fellow member, Mr. Stanley G. Flagg, Jr., who urges the association to do something in the way of original investigation for the purpose of overcoming difficulties in foundry practice If this be not possible, then encourage others in doing so, by advice and financial aid. The recent endowments by Mr. Carnegie along just these lines, though more naturally for the wider field of steel, may serve as an example. We might, therefore, get in touch with the universities where young men are preparing themselves for a life career, and would be only too glad to work on problems which have substantial after-results in a commercial way. The materials necessary would have to be furnished, and constant advice and conference with a special committee of our association would constitute our end of it. It would therefore be well to go into this question also, and see if something cannot be done of permanent value to the foundry industry.

An unusual amount of interest has been directed to the study of cast iron during the year, the direct consequence of which was the appointment of a representative committee of producers and users of cast iron. The purpose of this committee is to draw up standard specifications for testing cast iron and finished castings. This committee of 68 members, appointed jointly by the International and the American Societies for Testing Materials, finds our association well represented. Work is being pushed along rapidly and the results of our own investigations will be freely drawn upon. The full significance of this departure cannot yet be fairly gauged, but it really means that cast iron has been advanced into that class of our industries which may be termed the more exact. The haphazard methods of the past are being relegated to the rear, and science and practice are combined to hold the field for much of our work formerly in great danger of drifting into the malleable and steel casting plants.

Turning now to our own affairs, we can chronicle a most active and successful year. Thanks to the generosity of the New England Foundrymen's Association, who donated $425 to our treasury, to the proceeds of the Standardizing Bureau which gave us a profit of over $350, and finally to the Philadelphia Foundrymen's Association, who voted $100 to us to cover subscriptions to the Journal for its members, we can report an unusually large amount of literature distributed, all bills paid, and a balance of $59.42 in the treasury. The income for the year was $3,175.52, and the expenses $3,117.47.

Our members and subscribers now number 317, and the indications point to a more rapid growth, due to the recent establishment of special sections within the association, to facilitate the transaction of special lines of work. Much is expected from the new sections for foundry foremen and for the metallurgists. In the case of the latter, there has now been created a common ground for furnace and foundry. This has been quickly recognized, and we already count in our membership many furnace managers, and members of their official families. The work of these sections will best speak for itself.

The work of the various committees will be reported upon specially, and it only remains for me to express my personal thanks for the interest and help given me in my work for the association. The encouragement and sound advice which I have received from my many friends in our body has been most heartily appreciated, and has indeed been the direct cause of guiding our destinies at the parting of the ways. We now have our well-defined place in the industrial economy of the world, and with the unremitting support and encouragement of our members, will maintain this place with credit to ourselves and to our country.

Treasurer's Report.

Following the address of the president and the report of the secretary, which were listened to with the most appreciative interest, receiving hearty applause at their conclusion, the treasurer, Willis Brown, presented the financial statement, explaining that while the balance on hand was not large, measured by some standards, it was still forty times that of a year ago. The receipts were $3,175.52, added to $1.37 received from the preceding treasurer. The expenses, chiefly for the publication of the journal of the association and for various printing bills, apart from the $1,200 salary of the secretary, were $3,117.47. The balance on hand is $59.42. With all bills paid, this is the best showing the association has made in years.

Report of Committees.

The following reports of committees were presented in order:

ON THE STANDARDIZING BUREAU.

Your committee begs to report that the sales of the past years have exhausted the second sample of "C" and nearly all of "B." These samples were not at once renewed, as the West Foundry Co., in making improvements, was unable to re-arrange its small cupola, and it was furthermore not expedient to get the casting made by others on account of the special irons required, and the special method of molding, gating and pouring. The third sample "B" was cast during April, and is now in the hands of Prof. A. W. Smith, who will have it ready for distribution very shortly. Sample "C" will be cast as soon as suitable irons to make it are obtained.

The standards continue to grow in favor, and the old countries appreciate their value as well as the United States, as may be seen by the appended letter from the manager of the largest blast furnace in Russia (Sartana) in which he quotes the verdict of the superintendent of the chemical laboratory. "After three years' continual use of your standards, I find them of such a great assistance, and take pleasure in recommending them as settling any disputes that arise between the blast furnace and the laboratory, and for settling misunderstandings between purchasers and manufacturers. We can only wish them the most extensive application, and we con-

gratulate the association with success already attained.' (Signed) St. Prauss, superintendent of chemical laboratory of Nicopol-Mariopol Mining & Metallurgical Co. Works.

The accounts of the Bureau up to May 25, 1903, are as follows:

Total expenses to date	$ 806.89
Collections to date	$1742.84
Accounts receivable	$ 60.72
Drilling on hand	94 pounds

THOS. D. WEST, Chairman.

ON DETERMINING THE CONSTITUENTS OF CAST IRON.

Supplementing our report of last year, we beg to say that all the methods sent in by the many chemists interested were duly turned over to the new Metallurgical Section created within our association. Its secretary, Mr. H. E. Field, has carefully worked out a very systematic resume of the almost endless modifications of well-known methods, and in this way presented a clear and comprehensive grouping of data upon which to work It will now become a study of how far the reasons for elaborating the details of otherwise simple processes are founded on fact, and this will naturally take time and the practical interest of the best men in the profession.

When, therefore, the Metallurgical Section has been fully organized, work will commence along these lines, and it is to be hoped something tangible will result. From the universal interest aroused by this undertaking here and abroad, it may be readily seen that a vast amount of good is expected, and we hope that the next report on this subject may at least show the standardization of methods for determining one or two of the elements we deal with so much in our purchases and daily work.

ON STANDARD METHODS OF SAMPLING PIG IRON.

Your committee begs to report that the specifications for sampling pig iron submitted at the last convention for discussion, have been widely distributed, and so far have met with but one objection. This related to the use of the magnet in cleaning the sample. It seems that the even distribution of the graphite is liable to be disturbed by the too free use of the magnet, and that therefore this procedure is objected to by some chemists. In view of the formation of an international committee on the testing of cast iron and finished castings, which embraces not only our interests as foundrymen, or buyers of pig iron, but also those of the furnaces themselves; it has been deemed best to turn over our results to the sub-committee on pig iron, of that body, so that the final methods adopted may be accepted by all parties interested, the personnel of the committee assuring this assumption.

We therefore beg that this matter of standard methods of sampling pig iron be left for a final report after the deliberations of the International committee have resulted in arranging for standards, at least so far as the American practice is concerned. We can then endorse these methods if they fit our requirements, and know that they also meet with the approval of the other interests.

ON VALUATION OF FOUNDRY PIG IRON

Your committee beg to report that it is a very generally accepted proposition among foundrymen that the most reliable way to test pig iron is to remelt it in the cupola and pour into regular castings. In this way any possible accidents of fracture appearance in the pig iron tried, whether they are the result of furnace troubles or the deliberate desire to make a forge iron look like a No. 1 X, are eliminated, and the founder knows just what he is getting. On the other hand, it is also realized that unless proper methods are followed, only the best of coke is used, and everything about the trial is absolutely fair and first class, a grave injustice would be done the furnaceman.

As between the desire to test the iron by remelting, and the necessity to do this fairly, it becomes a difficult matter to specify just how to go about this. In fact one might think the whole proceeding somewhat radical, were it not for the fact that in the testing of cement the very same problem had to be encountered. Here it became a necessity that some standard sand be used to mix with the samples of cement to be examined, thus enabling experts in various parts of the world to make comparable tests. This selection of a standard sand is now being brought about, and shows that it will not be an impossibility to select a standard coke, a standard cupola, blast pressure, etc., for the testing of pig irons by remelting.

There would be, then, two things to be considered: First, the drawing up of standard specifications under which tests by remelting should be made, up to and including the preparation of the actual test bars for the comparative tests; and, secondly, the specification of the test irons, thus remelted, should be asked to pass. It is this latter point which causes your committee the difficulty, for the makers of the special grades of castings who would be only too glad to avail themselves of such a method to secure the highest grade irons for their work, are at the present time unable to assist your committee with the information necessary for this purpose.

We would, therefore, suggest that the whole subject be left an open one, and that we may be allowed to report whenever we have something tangible; suggesting in the meantime that the makers of rolls, furnace irons, car wheels, pipes, malleables, cylinders and other special machine castings, experiment along lines in remelting and testing best suited to their requirements, and keep your committee informed of their needs. In this way there will soon be something throwing light upon the one urgent requirement of the foundry industry tending toward a better and more uniform product.

ON INSURING PATTERNS.

Your committee begs to report that owing to the crowded condition of the foundry industry but little more than preliminary work could be done during the past year. Pursuant to the authority vested in the chairman by the last convention, the committee was enlarged by the addition of the following names: Messrs. C. J. Wolff, Chicago, Ill.; Thos. D. West, Sharpsville, Pa.; S. H. Stupakoff, Pittsburg, Pa.; Richard Moldenke, New York. The insurance interests, as represented by the National Board of Underwriters, have been very cordial in their dealings with your committee, everything pointing to a complete and equitable solution of the problem, thus assuring our foundrymen on the one hand prompter adjustment in case of losses, and the insurance interest, on the other, a tangible basis upon which these adjustments can be properly and fairly made.

We will report from time to time, as the details are settled, in the columns of our Journal, and it is hoped, will be in position to ask final action by the association at the next convention.

F. CONLIN, Chairman.

FOUNDRY TRADE SCHOOL.

J. S. Seaman, of Pittsburg, reported that, as the work of the committee on foundry trade school hinged on the Carnegie technical school movement in Pittsburg, the waiting attitude of the latter project left little to report. The money to build the school and the necessary endowment were ready and legislation had been passed providing public funds for the site; but the legality of the action on this last matter had been questioned, and politics had come in to delay action, the purchase of the site having been made in pursuance of an act appropriating money for park purposes.

Improvement of Foundry Practice.

The members of the association being called upon to discuss the suggestions of the president and secretary, David Spence commended the spirit of the president's address in the portion touching on the relations of employer and employe. He believed if the address could be widely distributed among the workmen in the foundries of the country, its reading would do much to create coöperation and to reduce strife and agitation.

Secretary Moldenke raised the question whether the preparation of instruction leaflets dealing with practical problems of the foundry, and their distribution among ambitious workmen, would not contribute to the raising of the standard of proficiency. He suggested that possibly such a work might be carried on under association auspices.

Thos. D. West, who had resigned one year before as chairman of the committee on trade school, said that in spite of the halt in the movement at Pittsburg he had confidence in the value and feasibility of the proposal. The bane of the foundry today he considered to be the smattering of information which

so many foundry workers have. A foundry trade school of the right character would help in solving the problem of incompetent foremen and workmen. Much of the friction with workmen, and many of the well-nigh unbearable conditions imposed upon employers, arose from the fact that so many men in charge of foundry operations are not practical and are largely at the mercy of employes.

On the motion of the secretary it was decided to appoint a committee, with Stanley G. Flagg, Jr., of Philadelphia, as chairman, to take in hand the furtherance of experimental work for the improvement of foundry practice and the overcoming of difficulties.

Conveyor for Cupola Slag.

The last feature of the morning session was a paper on "A Cupola Slag Conveyor," by Thos. D. West, of Sharpsville, Pa. The conveyor in question, manufactured by the C. O. Bartlett & Snow Co., of Cleveland, is being installed in the plant of the T. D. West Foundry Co. in connection with its proposed system of continuous melting, under which 20 to 22 tons an hour will come from the cupola for 24 hours in a day. An endless chain conveyor, with buckets, is provided and the molten slag dropped into the buckets from the cupola slag spout. As the solidified slag drops from the buckets at the end of the conveyor, it is deposited in a car or upon a pile.

In comment on the paper Dr. Moldenke said that as but one foundry in fifteen has a slag spout, the apparatus described presented some interesting possibilities.

Those in Attendance.

The following persons had registered up to Tuesday noon:

Adams, W. J., S. Obermayer & Co., Milwaukee.
Augenbraun, P. F., Yale & Towne Mfg. Co., Stamford, Conn.
Axner, Emil, Matthew Addy & Co., Chicago.
Bayley, Harry, Wm. Bayley & Sons Co., Milwaukee.
Brennaman, H. E., C. M. & St. P. Ry., Milwaukee.
Best, T. J., Warden, King & Sons, Ltd., Montreal.
Burroughs, E. R., Abendroth & Root Mfg. Co., Newburg, N. Y.
Bolens, H. W., Gibson Mfg. Co., Port Washington, Wis.
Boughton, H. G., Standard Sand & Fdy. Supply Co., Cleveland, O.
Barbier, Edw. E., Milwaukee.
Brown, Willis, Walker Foundry Co., Erie, Pa.
Brown, L. S., Springfield Facing Co., Springfield, Mass.
Blaurett, W. S., Solvay Process Co., Detroit, Mich.
Bell, Harry L., Dodge Mfg. Co., Mishawaka, Ind.
Banholzer, Andrew, Birmingham Machine & Fdy. Co., Birmingham.
Barker, R. F., Taylor, Wilson & Co., Ltd., Allegheny, Pa.
Burger, J. J., Lane Mfg. Co., Montpelier, Vt.
Behling, C. H., Lindemann-Hoverson Co., Milwaukee.
Brownley, F., Lindemann-Hoverson Co., Milwaukee.
Benjamin, Emil, Great Western Smelting Co., Chicago.
Beckwith, A. K., Dowagiac, Mich.
Brown, Jas., Mesta Machine Co., Pittsburg, Pa.
Bair, A. W., C. M. & St. P. Works, Milwaukee.
Bair, E. H., C. M. & St. P. Works, Milwaukee.
Caldwell, F. S., Michigan Heater Co., Big Rapids, Mich.
Charles, A. J., Preble Machine Co., So. Chicago, Ill.
Cruice, T., Hewett Mfg. Co., Milwaukee.
Cotby, M. J., Ottawa, Ill.
Crivel, Geo. F., F. B. Stevens, Detroit, Mich.
Cawbiar, Jacob, Colorado Fuel & Iron Co., Pueblo, Colo.
Comstock, Jas. H., Henry McShane Co., Baltimore, Md.
Colvin, Theo. N., Colvin Foundry Co., Providence, R. I.
Chambers, Wm., Garden City Fan Co., Chicago.
Cope, Geo. W., *Iron Age*, New York City.
Carrier, W. H., Buffalo Forge Co., Buffalo.
Carrollton, R. D., Illinois Steel Co., Chicago.
Coleman, John G., Wisconsin Malleable Iron Co., Milwaukee.
Dickson, E. N., Allis-Chalmers Co., Milwaukee.
Douglass, W. L., Hewett Mfg. Co., Milwaukee.
Dings, M., Dings Electro-Magnetic Separator Co., Milwaukee.
Dickson, Philip S., Allis-Chalmers Co., Milwaukee.
Dopp, J. W., Tabor Mfg. Co., Philadelphia.
Dye, J. Frank, Newport Sand Bank Co., Newport, Ky.
Diller, H. E., Western Electric Co., Chicago.
Dowdakin, John E., American Fdy. Co., Rockford, Ill.
Draves, Wm. A., Northwestern Malleable Iron Co., Milwaukee.
Eagan, D. F., H. E. Pridmore, Chicago.
Etting, Frank M., Edw. J. Etting, Philadelphia.
Evans, David, Field-Evans Iron Co., Chicago.
Evans, Jas. E., S. Obermayer & Co., Chicago.
Ericson, Frank A., McCormick Harvester Co., Chicago.
Estep, Ezra, Sandwich Mfg. Co., Sandwich, Ill.
Fairbairn, W. J., Sec'y Milwaukee Fdy. Ass'n, Milwaukee.
Fisher, S. H., Harrisburg Fdy. & Machine Works, Harrisburg, Pa.
Fitzpatrick, Wm. M., S. Obermayer & Co., Pittsburg, Pa.
Fahey, Edw., J. D. Smith Fdy. Supply Co., Cleveland.
Fraser, Donald, Chain Belt Co., Milwaukee.
Field, Hubert S., Farrell Fdy. & Machine Co., Ansonia, Conn.
Ford, J. C., Spring Lake Iron Co., Fruitport, Mich.
Ferguson, W., Wm. Ferguson Fdy. Co., Chicago.
Findley, A. L., *The Iron Trade Review*, Cleveland.
Fry, Wm. C., Chain Belt Co., Milwaukee.
Flintermann, R. F., Chicago.
Frobve, W. D., Phillips & Buttorff Mfg. Co., Nashville, Tenn.
Falk, Gen. Otto, Falk Co., Milwaukee.
Flagg, Stanley G., Stanley G. Flagg & Co., Philadelphia.
Forsythe, J. F., Thomas Furnace Co., Milwaukee.
Greene, W. M., Hawley Down Draft Furnace Co., Chicago.
Gartside, Wm. N., Diamond Clamp & Flask Co., Richmond, Ind.
Gibby, N. E., Canada Foundry Co., Boston, Mass.
Grace, R. W., Bucyrus Co., South Milwaukee, Wis.
Gomersall, Ben, Battle Creek Iron Works, Battle Creek, Mich.
Gilmour, E. B., Acme Harvester Co., Peoria, Ill.
Grunun, W. F., Erie City Iron Works, Erie, Pa.
Gow, John, General Electric Co., Schenectady, N. Y.
Glasscock, Thos., Pawling & Harnischfeger, Milwaukee.
Golden, J. P., Golden Foundry & Machine Co., Columbus, Ga.
Greenlee, W. B., Greenlee Fdy. Co., Chicago.
Gordon, F. E., Ohio Sand Co., Conneaut, Ohio.
Garrigan, D., Beloit, Wis.
Greenslade, John, Greenslade Fdy. Co., Milwaukee.
Gobeille, Jos. L., Gobeille Pattern Co., Cleveland.
Griffiths, Geo. H., *The Iron Trade Review*, Chicago.
Green, M. J., American Foundry Co., Rockford, Ill.
Goedke, Chas. F., Wm. R. Perrin Co., Chicago.
Greenslade, O. W., Greenslade Fdy. Co., Milwaukee.
Hauch, A. P., Allis-Chalmers Co., Milwaukee.
Harrington, N. T., Allis-Chalmers Co., Milwaukee.
Hanson, Anton, Phœnix Mfg. Co., Eau Claire, Wis.
Hansen, Henry, *The Foundry*, Cleveland.
Hill, John, Hill & Griffith Co., Cincinnati, O.
Hawkins, Syle W., Craig Fdy. Co., Toledo, O.
Howlett, F. P., Dodge Mfg. Co., Mishawaka, Ind.
Hutton, Wm. W., Advance Thrasher Co., Battle Creek, Mich.
Haglman, Henry J., Grand Rapids, Mich.
Hettiger, E. P., Hickman-Williams Co., Chicago.
Hinners, F. E., G. H. Smith Steel Casting Co., Milwaukee.
Harrison, A. E., Allis-Chalmers Co., Milwaukee.
Hyde, W. F., Brand Stove Co., Milwaukee.
Hyndman, N. P., Washington Coal & Coke Co., Pittsburg.
Hamer, B. C., Jenkins & Reynolds Co., Chicago.
Hoffman, B., Hoffman-Billings Co., Milwaukee.
Harper, Wm. P., Allis-Chalmers Co., Milwaukee.
Harper, J. P., Allis-Chalmers Co., Milwaukee.
Johnston, S. T., S. Obermayer & Co., Chicago.
Jenkins, W. A., J. Thompson & Sons Mfg. Co., Beloit, Wis.
Jones, F. L., J. Howard Jones & Son, Chicago.
Jones, Miss E. F., Preble Machine Works, So. Chicago, Ill.
Jones, D. M., Gardner-Campbell Co., Milwaukee.
Jones, C. L., Falk Co., Milwaukee.
Kalvelage, J. B., Hoffman-Billings Mfg. Co., Milwaukee.
Knox, S. L. G., Bucyrus Co., So. Milwaukee, Wis.
Krisher, Jacob, Akron Fdy. Co., Akron, O.
Krisher, Perry A., Krisher Brass Fdy. Co., Akron, O.
Kozmin, Peter A., Prof. of Technology, St. Petersburg, Russia.
Knowles, W. H., Ottawa, Ill.
Knight, S. S., Birmingham Pipe & Casting Co., Birmingham, Ala.
Koons, A. F., Webster, Camp & Lane Co., Akron, O.
Kuhn, J. B., Hoffman Mfg. Co., Milwaukee.
Keltenhofen, P. M., Lindemann-Hoverson Co., Milwaukee.
Kane, W. H., McCormick Harvesting Co., Chicago.
Kohler, Walter, J. M. Kohler Sons Co., Sheboygan, Wis.
Lindemann, A. J., Lindemann-Hoverson Co., Milwaukee.
Leuthner, Frk., Lackawanna Steel Co., Buffalo, N. Y.
London, Arch. M., J. B. & J. M. Cornell, Cold Spring, N. Y.
Lambert, E. J., Syracuse Chilled Plow Co., Syracuse, N. Y.
Link, A. W., Erie Foundry Co., Erie, Pa.
Lyon, E. J., Brown & Sharpe, Providence, R. I.
Lefeire, W. H., Excelsior Fdy. Co., Bay City, Mich.
Lafever, Minard, Advance Thresher Machine Co., Battle Creek, Mich.
Loudenbeck, H. C., Westinghouse Air Brake Co., Pittsburg.
Lamoreux, D. P., Beaver Dam Mall. Iron Co., Beaver Dam, Wis.
Lane, G. H. T., Lane & Bodley Co., Cincinnati, O.
Lemon, E. B., Illinois Steel Co., Milwaukee.
Louis, C. E., A. M. Crane & Co., Chicago.
Latimer, H. D., Pawling & Harnischfeger, Milwaukee.
Moldenke, Dr. Richard, Sec'y Am. F'd'ymen's Ass'n, New York City.
MacPharran, R. S., Allis-Chalmers Co., Milwaukee.
Mitchell, A. S., Milwaukee.
Manchester, A. E., C. M. & St. P. Ry., Milwaukee.
Miller, J. C., C. M. & St. P. Ry., Milwaukee.
Mavro, G., Wm. Bayley & Sons Co., Milwaukee.
McPhee, Hugh, Eaton, Cole & Burnham, Bridgeport, Conn.
Monahan, J. L., Filer & Stowell Co., Milwaukee.
Manning, J. C., Preble Machine Works, So. Chicago, Ill.
Macduff, Andrew, Stilwell-Bierce & Smith-Vaile Co., Dayton, O.
Murphy, Jas. A., Ball Engine Co., Erie, Pa.
McLain, David, National Electric Co., Milwaukee.
Magee, John, Magee Furnace Co., Boston, Mass.
Mills, J. F., Abendroth Bros., New York City.
Malone, T. E., J. S. McCormick Co., Pittsburg.
McCormick, J. S., J. S. McCormick Co., Pittsburg.

Martin, Richard T., Collins & Burger, Merango, Ill.
MacDougall, D., Pittsburg Steel Fdy., Pittsburg.
McNeal, Charles, Garden City Sand Co., Chicago.
McArthur, C. E., Western Electric Co., Chicago.
McRoberts, S. A., "American Manufacturer," Pittsburg.
Mesta, F. E., Mesta Machine Works, Pittsburg.
Munson, Wm. B., Lewis Foundry & Machine Co., Pittsburg.
McDowell, Irvin, Field-Evans Iron Co., Chicago.
Mathews, J. H., Milwaukee.
Nostrand, H. P. G., Hawley Down Draft Furnace Co., Chicago.
Neacy, T. J., Filer & Stowell Co., Milwaukee.
Nortmann, V., Nortmann & Duffke Co., Milwaukee.
Nauert, Herman, Bridgeway, Pa.
Nieneen, Thos. C., Milwaukee.
Ormrod, John D., Donaldson Iron Co., Emaus, Pa.
Payton, Martin, S. Obermayer & Co., Madison, Wis.
Pridmore, H. E., H. E. Pridmore, Chicago.
Patton, W. S., Patton Bros. Co., Marietta, O.
Pawling, A., Pawling & Harnischfeger, Milwaukee.
Perry, M. C., Woolley Foundry & Machine Co., Anderson, Ind.
Parks, H. S., Coburn Trolley Track Mfg. Co., Holyoke, Mass.
Petterenck, E. R., Milwaukee.
Quinn, H. T., Crane Co., Chicago.
Reynolds, Irving H., Allis-Chalmers Co., Milwaukee.
Reade, Walter, Filer & Stowell Co., Milwaukee.
Rundel, E. K., Rundel Mfg. Co., Milwaukee.
Rowlands, J. T., Rowlands Machine Co., Racine, Wis.
Roper, Geo. D., American Foundry Co., Rockford, Ill.
Ricker, A. J., Stowell Mfg. & Fdy. Co., So. Milwaukee, Wis.
Roenius, Otto R., Grand Rapids Fdy. Co., Grand Rapids, Wis.
Ramp, H. M., General Electric Co., Schenectady, N. Y.
Reardon, John, Filer & Stowell Co., Milwaukee.
Rock, Martin, Geo. H. Smith Steel Casting Co., Milwaukee.
Rider, W. A., Whiting Fdy. Equipment Co., Chicago.
Roberts, H. H., *Iron Age*, Chicago.
Shade, G. C., Braddock Machine & Mfg. Co., Pittsburg.
Sly, W. W., W. W. Sly Mfg. Co., Cleveland.
Sheriff, T. W., Sheriff Mfg. Co., Milwaukee.
Sercomb, C. A., C. A. Sercomb Mfg. Co., Milwaukee.
Schwab, R. J., Schwab & Sons Co., Milwaukee.
Spence, David, Greenlee Fdy. Co., Chicago.
Sammond, C. E., Stowell Mfg. Co., So. Milwaukee, Wis.
Shinafeldt, W. L., C. M. & St. P. Ry., Milwaukee.
Scheck, Christ, C. M. & St. P. Ry., Milwaukee.
Shaw, J. Geo., Smith Steel Casting Co., Milwaukee.
Shaw, Bartlett M., Walker & Pratt Mfg. Co., Boston.
Shepard, C. D., Wm. M. Crane Co., New York City.
Sleeth, L. D., Westinghouse Air Brake Co., Pittsburg.
Scott, Wm., Roe-Stevens Mfg. Co., Detroit, Mich.
Seaman, I. S., Seaman-Sleeth Co., Pittsburg.
Stupakoff, S. H., Fullman Co., Pittsburg.
Seelman, A. B., Hoffman Mfg. Co., Milwaukee.
Smith, P. G., J. D. Smith Fdy. Supply Co., Cleveland.
Sargent, W. C., Chain Belt Co., Milwaukee.
Smith, Geo. H., Geo. H. Smith Steel Casting Co., Milwaukee.
Stewart, Ethelbert, U. S. Dept. of Labor, Washington, D. C.
Sawyer, F. L., N. W. Mall. Iron Co., Milwaukee.
Search, C. Edw., Allis-Chalmers Co., Milwaukee.
Schwab, Louis, N. Deutsch & Co., Chicago.
Shepard, C. L., Wm. Crane Co., Milwaukee.
Taylor, John, C. M. & St. P. Ry., Milwaukee.
Thomas, Chas. H., Hay Fdy. & Iron Works, Newark, N. J.
Thielges, Chas., Greenslade Fdy. Co., Milwaukee.
Thrope, Fred D., Holyoke, Mass.
Tratman, E. E. R., *Engineering News*, Chicago.
Toggart, Frank D., United Engineering & Fdy. Co., Youngstown, O.
Thomas, J. D., Sterritt-Thomas Fdy. Co., Pittsburg.
Thompson, A. L., Thompson & Son Mfg. Co., Beloit, Wis.
Turnbull, R. E., Henry E. Pridmore, Chicago.
Vilter, Theo., Vilter Mfg. Co., Milwaukee.
Voelkel, Ed. S., Forster-Waterbury Co., Franklin Park, Ia.
Vrooman, H. S., Chicago.
Vance, H. M., E. E. Hanna Co., Chicago.
Werner, A., New Process Pattern Letters Co., Milwaukee.
Walker, Arthur W., Walker & Pratt Mfg. Co., Boston.
Whittaker, S. H., Dayton Coal & Iron Co., Cincinnati, O.
Woodison, E. J., S. Obermayer & Co., Detroit, Mich.
Winchester, I., Magee Foundry Co., Chelsea, Mass.
West, Thos. D., Thos. D. West Fdy. Co., Sharpsville, Pa.
Wilson, Wm. W., S. Obermayer & Co., Pittsburg.
Woodbury, F. E., Milwaukee Coke & Gas Co., Milwaukee.
Wuerster, E. A., Falk Co., Milwaukee.
Yagle, Wm., Wm. Yagle & Co., Ltd., Pittsburg.

TUESDAY AFTERNOON.

At the afternoon session, the first paper was by Jos. Leon Gobeille, of Cleveland, on "The Organization, Maintenance and Management of a Modern Patternshop." As given elsewhere in this issue, it was based on the actual operations and experience of years in Mr. Gobeille's plant and was illustrated by photographs and diagrams as well as a model of the Gobeille segment machine. An interesting discussion followed.

The meeting then organized as the Foundry Foreman's section with Archie M. Loudon, of New York, in the chair, and the following papers were read: "Foundry Management," by David Spence, Chicago; "Permanent Molds," by James A. Murphy, of Erie; "Molding Machines," Edward Gilmour, Peoria, Ill.; "Trials of a Foundry Foreman," S. H. Stupakoff, Pittsburg. The session brought out a very profitable interchange of views, participated in by proprietors, superintendents and foremen, the attendance being considerably larger than at the morning session. The following committees were announced: Auditing, J. S. Seaman, Wm. Yagle and S. H. Stupakoff, all of Pittsburg; on nominations, Wm. Yeagle, Pittsburg, John McGee, Boston, J. P. Golden, Columbus, Ga., Adam Bair, Milwaukee, T. J. Best, Montreal.

The Tuesday evening session brought out a large attendance and lasted until 11 o'clock, thus making the day a record one in point of sustained attention to papers and discussions. The paper on "Retort Oven Coke for Foundry Use," by W. J. Keep, of Detroit, was read by W. S. Blauvelt, of the Solvay Process Co., Detroit, who also answered questions concerning foundry experience with by-product coke made in Semet-Solvay ovens.

In the discussion of this subject, Mr. McGee, of Boston, told of the satisfactory use in stove work of German by-product coke, which he had been able to buy delivered in New England at 50 cents a ton less than American coke. Even since prices of domestic coke have receded, this foundry has placed an order for 500 tons of German coke in view of the good results attained. Dr. Moldenke read by title his paper on "Malleable Cast Iron" and answered a steady fire of questions from those present specially interested in malleable work.

W. H. Carrier, of the Buffalo Forge Co., read a paper on "Heating and Ventilating Foundries and Machine Shops," and showed a number of interesting lantern slide views. He was followed by S. S. Knight, of the Birmingham Pipe & Casting Co., Birmingham, Ala., who made a most striking presentment of the coal and iron ore resources of the Alabama district, the accompanying screen views giving a good idea of the variety and extent of the iron industry about Birmingham.

CONVENTION NOTES.

At a meeting of the Foundry Foreman's Association, held Monday evening, a number of topical questions were discussed at length, the session lasting until after 11 o'clock. The following officers were elected for the ensuing year: President, Chas. H. Thomas, Hay Foundry & Iron Works, Newark, N. J.; vice president, E. B. Gilmour, Acme Harvester Co., Peoria, Ill.; secretary and treasurer, J. A. Murphy, Ball Engine Co., Erie, Pa.

The entertainment arrangements of the Milwaukee foundrymen are most complete and the delegates speak warmly in praise of the hospitality of the city. Visits are being made by many of the superintendents and foremen to the local foundries.

St. Louis foundrymen have sent an invitation to the association to hold its convention of 1904 in that city during the exposition.

It is thought probable that Willis Brown, of the Walker Foundry Co., Erie, Pa., will be elected president for next year.

New Coke-Selling Company.

(Special Telegram.)

PITTSBURG, PA., June 10.—The Pickands-Magee Coke Co., Pittsburg, will receive a charter next week. It was formed by W. C. Magee, formerly general sales agent of the H. C. Frick Coke Co. and Pickands, Brown & Co., of Chicago, who do a large coke business. Beginning this year the H. C. Frick Coke Co. stopped marketing the product of a number of outside Connellsville coke companies and the object of the new company is to continue business dropped by the Frick Co., taking coke of various producers and marketing it. It does not propose to make coke itself. Formal organization awaits the granting of the charter.

The works of the Eleanor Iron & Steel Co., Irwin, Pa., will be enlarged by the addition of an open-hearth plant, which will cost $200,000.

THE PHILADELPHIA FOUNDRYMEN'S ASSOCIATION.

The regular monthly meeting of the Foundrymen's Associatoin was held at the Manufacturers' Club, in Philadelphia, on Wednesday, June 3, the president, Thomas Devlin, occupying the chair. The following were present:

Thos. Devlin, Thos. Devlin Mfg. Co.
J. Thompson, J. Thompson & Co.
P. D. Wanner, Reading Foundry Co., Reading, Pa.
G. A. Messick and J. Parker Jefferis, Pusey & Jones Co., Wilmington, Del.
S. B. Gibbons and F. C. Pullman, J. Wesley Pullman.
Arthur Simonson, Wm. Wharton, Jr., & Co.
J. Wesley Bartine, Buffalo Forge Co.
O. J. Ward, Howe Scale Co.
W. S. Hallowell, Harrison Safety Boiler Works.
Geo. Haag, North Wales Foundry Co., North Wales, Pa.
A. L. Jenning, B. F. Sturtevant Co.
J. W. Burr, Burr & Houston Co., Brooklyn, N. Y.
C. D. Matthews, Camden Iron Works, Camden, N. J.
Jas. McAnnally and H. P. Jackson, Harlan & Hollingsworth Co., Wilmington, Del.
Dr. E. E. Brown and A. D. Wallace, E. E. Brown & Co.
W. J. W. Moore, Pilling & Crane.
Thos. Holt and Wm. Cannon, Camden Foundry Co., Camden, N. J.
W. H. Hunt, Wm. Adams Foundry Co.
J. Hy. Pepper, *The Iron Trade Review.*
Thos. J. Kelly and Edw. Bunting, Thomas, Roberts, Stevenson Co.
W. E. Arnold and T. F. Arnold, L. & R. Wister & Co.
P. J. Potter, E. J. Etting.
H. L. Tripple, Standard Scale Co., Pittsburg.
H. Frame, Robt. Wetherill & Co., Chester, Pa.
M. Sims, National Steel Foundry Co., New Haven, Conn.
T. B. Harkins, Harkins Foundry Co., Bristol, Pa.
W. H. Ridgway, C. Ridgway & Son Co., Coatesville, Pa.
W. O. Steele.
A. J. Mott, Jr., Abram Cox Stove Co.
R. C. Oliphant, Trenton Malleable Iron Co., Trenton, N. J.
Geo. C. Davis, Chemist.
Fred. Bateman, Bateman Mfg. Co., Grenloch, N. J.
J. J. McCrystal, Girard Iron Works.
A. G. Warren, J. W. Paxson Co.
A. A. Miller, *Iron Age.*
F. C. Price, E. J. Etting.
Prof. Jos. A. Holmes, St. Louis Exposition.
Francis L. Sheppard, I. A. Sheppard & Co.
C. Gorman, Schaum & Uhlinger.
Wm. Dowick, Robt. Wetherill & Co., Chester, Pa.
W. H. Green, Vulcan Works., Chester, Pa.
Edw. Page, J. K. Dimmick & Co.
Howard Evans, J. W. Paxson Co.

The treasurer made a report showing a balance of nearly $2,000 in the treasury and all bills paid.

The following were elected to membership in the association: The Bethlehem Steel Co., Bethlehem, Pa.; The Camden Foundry Co., Camden, N. J.; Bernstein Mfg. Co., Philadelphia; Standard Scale & Supply Co., Pittsburg, Pa.; The Bateman Mfg. Co., Grenloch, N. J.; and The American Glutrose Co., Camden, N. J.

In the call for the meeting it was stated there would be a discussion on "The Wage Question for Molders and Coremakers," but in view of the fact that the foundrymen of Philadelphia and vicinity had met in a discussion of the same question on the day preceding the meeting it was not deemed advisable to further discuss the matter.

Professor Joseph A. Holmes, chief of the Department of Mines and Metallurgy of the St. Louis Exposition, was introduced by Secretary Evans and addressed the meeting in an endeavor to enlist the support of the members in making a thoroughly representative foundry exhibit at the exposition. If, in the opinion of the trade, it was thought practicable, efforts would be made to install a thoroughly modern foundry at the exposition in which could be shown the latest and best ideas in equipment, and in which could be demonstrated all foundry methods for making the different classes of castings turned out in this country. The foundry would be under the management of a practical and experienced foundryman and operated daily. He suggested that, if the association felt inclined to support the plan, a committee be appointed to determine the scope.

Mr. Devlin thought the plan a good one, but too much of an undertaking for the association to handle alone. He suggested that the American Foundrymen's Association and the National Foundrymen's Association be invited to support the project, and that the proposed committee co-operate with committees from those associations.

On motion of Dr. Brown it was resolved that the association was in favor of the scheme, and that a committee be appointed by the president to act in concert with committees from other associations in the giving of assistance to carry out the idea.

The paper of the evening was by Wesley Bartine, of the Buffalo Forge Co., Buffalo, N. Y., on "Heating and Ventilating Foundries." The paper was illustrated by lantern slides. There was no discussion.

The next meeting of the association will be held on the first Wednesday in September.

NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION.

(Special Telegram.)

WORCESTER, MASS., June 9.—The convention of the National Machine Tool Builders' Association commenced this morning for a two days' session. Reports of committees will be the principal business. Among the members present are the following: J. B. Doan, American Tool Works Co., Cincinnati; W. H. Burtner, Cincinnati Planer Co., Cincinnati; R. K. LeBlond, LeBlond Machine Tool Co., Cincinnati; Joseph Flather, Flather & Co., Nashua, N. H.; W. P. Davis, W. P. Davis Machinery Co., Rochester, N. Y.; Enoch Earle, P. Blaisdell & Co., Worcester, Mass.; P. E. Montanus, Springfield Machine Tool Co., Springfield, O.; Wm. Lodge, Lodge & Shipley Machine Tool Co., Cincinnati, O.; E. M. Woodward, Woodward & Powell Planer Co., Worcester, Mass.; A. H. Tuechter, Cincinnati Machine Tool Co., Cincinnati; Fred L. Eberhardt, Gould & Eberhardt, Newark, N. J.; Henry Binsse, Binsse Machine Co., Newark, N. J.; C. F. Mayer, Rahn, Mayer & Carpenter Co., Cincinnati; F. E. Reed, F. E. Reed Co., Worcester, Mass.; J. R. Back, F. E. Reed Co., Worcester, Mass.; H. G. Barr, Worcester, Mass.; P. G. March, Cincinnati Shaper Co., Cincinnati; J. S. Detrick, Detrick & Harvey Machine Co., Baltimore, Md.; A. W. Whitcomb, Whitcomb Mfg. Co., Worcester, Mass.; Chas. F. Hilker, Hamilton Machine Tool Co., Hamilton, O.; E. E. Schumacher, Schumacher & Boye, Cincinnati; B. F. Barnes, B. F. Barnes Co., Rockford, Ill.; E. W. Whitmore, Prentice Bros. Co., Worcester, Mass.; A. M. Powell, Woodward & Powell Planer Co., Worcester, Mass.; Chas. Thwing, Draper Machine Tool Co., Worcester, Mass.; J. W. Carrel, Draper Machine Tool Co., Worcester, Mass.; Geo. F. Stewart, Bradford Machine Tool Co., Cincinnati; Philip Fosdick, Fosdick Machine Tool Co., Cincinnati; Wm. A. Greaves, Greaves & Klusman.

Among the visitors present are the following: M. P. Higgins, Norton Emery Wheel Co., Worcester, Mass.; W. A. Wilson, Wilson Machine Co., Rochester, N. Y.; R. J. Leavitt, J. R. Vandyck Co., New York City; J. R. Vandyck, Higley Machine Co., New York City; A. L. Lovejoy, Becker-Brainard Co., Hyde-Park, Mass.; R. L. Windholz, A. E. Kinsey Co., Cincinnati; Geo. C. Montague, Norton Grinding Co., Worcester, Mass.; Philip O. Geier, National Metal Trades Association, Cincinnati; P. B. Kendig, Seneca Falls Mfg. Co., Seneca Falls, N. Y.; Joseph Wolf, Hisey-Wolf Machine Co., Cincinnati; D. Hunt, Jr., Baush Machine Tool Co., Springfield, Mass.; Robert Wuest, secretary National Metal Trades Association, Cincinnati; John A. Hill, *American Machinist,* New York City; T. G. Meachem, New Process Raw Hide Co., Syracuse, N. Y.; F. S. Weatherby, *American Machinist,* New York City; W. R. Wallis, *American Machinist,* New York City; A. C. Luchars, *Machinery,* New York City; G. H. Gardner, *The Iron Trade Review,* Cleveland; D. C. Warren, *The Iron Trade Review,* New York City; Walter C. English, *Iron Age,* Boston, Mass.; Fred Schultz, *Iron Age,* New York City; John Nelson, *Iron Age,* Worcester, Mass.

Tuesday evening the Worcester members gave a trolley ride to Lake Quinsigamond and launch ride on the lake, stopping at different points and winding up at the Quinsigamond Club, where an elaborate dinner was served to about seventy members and invited guests. Wednesday noon the Norton Emery Wheel Co. will entertain all members and friends with a trolley ride and luncheon at its works, after which the company gives a display of the latest grinding methods.

There is much enthusiasm in the association over the good results which, it is expected, will be accomplished.

PERSONAL.

L. B. Ball has resigned as general manager of the Locke Steel Belt Co., of Bridgeport, Conn., with which he has been connected for the past two years, and has removed to Detroit to become manager and treasurer of the Michigan Sprocket Chain Co., Ltd.

Michael Baackes, who has been often called the father of the wire nail industry in the United States, sails this week for Germany, accompanied by Mrs. Baackes, and they will reside there permanently. His home will be in Krefeld, but he will open offices in Düsseldorf, representing the Uehling Co., Ltd., on the Continent for the more general introduction of its pig iron casting machinery. Mr. Baackes came to the United States from Germany in 1874, and in 1875 started a plant at Covington, Ky., under the name of the American Wire Nail Co., for the manufacture of wire nails. In 1879 he became connected with Henry Chisholm in the H[illegible] Nail Co., of Cleveland, and in 1889 transferred his interests to the Baackes Wire Nail Co., afterward part of the Consolidated Wire Co., and later absorbed by the American Steel & Wire Co. Mr. Baackes spent most of 1899 and 1900 in Germany and in the latter year returned to the United States, engaging in business in Cleveland as a consulting engineer.

S. T. Wellman, president of the Wellman-Seaver-Morgan Co., Cleveland, and C. Ernst, of the engineering staff of the company, have gone to Europe.

Ralph Crooker, Jr., has been appointed consulting engineer for the Jones & Laughlin Steel Co. Mr. Crooker will have charge of all improvements to be made by the company.

William A. Rogers was elected president, Frank H. Goodyear vice president, Charles W. Goodyear second vice president, and Hugh Kennedy general manager of the Buffalo & Susquehanna Iron Co. at a recent meeting in Buffalo.

Harry Doyle, has resigned as superintendent of the pipe mills, of Spang, Chalfant & Co., of Pittsburg, to become general manager of the new pipe and tube mills of the Susquehanna Iron & Steel Co. at Columbia, Pa.

J. F. Lewis, for 27 years in the service of the Carnegie Steel Co. in various capacities, beginning as machinist's apprentice, has been appointed assistant superintendent of the Edgar Thomson steel works, blast furnaces and foundries, succeeding Chas. E. Dinkey, recently made superintendent. A. E. Maccoun succeeds Mr. Lewis as master mechanic.

Thomas Morrison, who recently retired from the position of general manager of the Edgar Thomson Steel Works, was the recipient of a chest of silver from the superintendents and foremen of the various departments. James E. Mitchell, Mr. Morrison's private secretary, who also retires, was presented with a gold watch. Assistant General Superintendent John A. Lewis was presented with a horse and buggy.

Thomas Shea, for the past ten years general superintendent of the Oswego, N. Y., plant of the Railway Steel Springs Co., has tendered his resignation. He will be succeeded by Washington Lavery, who for several years has been assistant superintendent of the Motive Power of the Erie Railroad. Frederick Lack, of Philadelphia, has been made general foreman. Mr. Shea is interested with George R. Sloan, Jr., of Oswego, in a number of valuable patents for the manufacture of springs. They have received a number of offers and assistance in the erection of a plant for the manufacture of springs, one of which is from Chicago, but are not yet prepared to disclose their plans.

Wm. Jessop, head of the Wm. Jessop & Sons steel mills, Sheffield, Eng., arrived recently in San Francisco. He left England last November, and since then has visited Spain, Australia, China, Japan and Hawaii. He was in Denver a few days ago, and will spend some time visiting Eastern cities.

The Midvale Steel Co., of Philadelphia, was awarded the contract for 24 8-inch nickel steel guns, and the Bethlehem Steel Co. the contract for 36 7-inch nickel steel guns for a new 16,000-ton battleship now being built by the United States Government. The contracts awarded involved approximately $1,000,000.

EASTERN PENNSYLVANIA.

HARRISBURG, PA., June 9.—The first week of June found all companies in this part of the Keystone State in operation and a more comfortable feeling prevailing regarding labor. Comparatively few works are affected by strikes and the general impression is that the worst has passed. Orders are reported as fair. Better deliveries are being made by the railroads which have made big strides toward improvement of lines in the last year or so.

The car works in this part of the State have been booking a number of orders and their product for this year may equal that of 1902. The coal-carrying roads have been ordering cars and there have been taken a number of foreign orders, including some for Mexico. Locomotive works, engine building and repair works operated by railroads have been working hard.

The secretary of the commonwealth has issued a charter in this city to the Union Forge Co., of Pittsburg. The directors are: J. Y. Fitzgerald, D. E. Mitchell and J. B. Marshall, all of Pittsburg. The Rimersburg & Sligo Coal & Iron Co. has also been chartered. It will have its offices at Clarion.

The Lackawanna Iron & Steel Co. will blow in another furnace in the Lebanon Valley district.

The sale of the plant of the Eastern Steel Co., at Pottsville, which has been under improvement for over a year is taken to mean reorganization of the company. The concern took over the plant of the Pottsville Iron & Steel Co., including the Pioneer furnaces, rolling mills and steel works and is building a large rolling mill and construction department. Prominent New York men are interested in the company.

The molders of this part of the State are asking for higher pay and the establishment of a minimum wage rate and holiday rate. In a number of instances they have been refused and some have stopped work. At Chester the men in a number of plants have returned to work.

The New Jersey Zinc & Iron Co. has increased the wages of all employes at its works at Bethlehem. Five percent was allowed without solicitation.

The Consolidated Hardware Mfg. Co., of Reading, has been formed with a New Jersey charter and a capital of $2,500,000 to take over the works of the various hardware concerns at Reading. The Reading Hardware Co. and the Keystone Hardware Co. have already been absorbed. A. A. Gery is president; John E. Harbster, vice president, and H. L. Boas, secretary and treasurer. Men well known in the trade are interested.

The sales agents of the Pennsylvania and Maryland steel companies held their annual meeting and dinner here on Wednesday and heard reports from the agents throughout the country. The general conditions were reported as fair and there was a general impression that considerable work is in sight. Howard F. Martin, general manager of sales, presided. All offices were represented.

The Reading Iron Co. has started its Ninth street plant and it will be run regularly. The company is now operating all of its plants at Reading.

Fletcher H. Knight, well known as the superintendent of the furnaces of the Thomas Iron Co. for years and at the head of several enterprises, is dead. He had been ill for some time.

The State has granted a charter to the Cresson Foundry, Machine & Car Works, which will build a plant near Altoona. The company starts with a capital of $5,000 which is to be increased. A number of Cambria County people are interested, J. W. Kephart, of Ebensburg, being at the head of the concern.

Otto C. Burkhardt has resigned as superintendent of the furnaces of the Pennsylvania Steel Co., in Steelton and Harrisburg, and John N. Reese has been made superintendent.

The Allison Mfg. Co., well known for its manufacturing of cars and similar apparatus at Philadelphia, has gone out of business and the business is being closed up. The plant has been bought by the Pennsylvania Railroad Co. and the noted works will be dismantled.

The burned mills of the Central Iron & Steel Co., in this city, are to be replaced with steel structures. The damage is not so great as feared at first.

RETORT OVEN COKE FOR FOUNDRY USE.*

BY W. J. KEEP, DETROIT.

My excuse for saying a few words on this subject is that for a year and a half I have used retort oven coke exclusively, melting about 80 tons of iron per day. I have used coke made at three different plants, from Hamilton, O., Sharon, Pa., and Detroit. This coke was made from a great variety of coals from West Virginia and Pennsylvania. The coke used during 1902 was made in Detroit and was uniformly good. At times during January and February of this year we received some coke that was not satisfactory, because the makers could not procure proper coal owing to transportation difficulties. When this condition changed the coke again became satisfactory and has continued to be so.

During these same early months of 1903 founders all over the country had trouble with coke in bee-hive ovens. Founders in many parts of the country were obliged to take any kind of coke that they could get in order to keep running. During the past season most of the best deposits of coking coal in the Connellsville region have been purchased by the United States Steel Corporation, and very little genuine Connellsville coke is available for general foundry use. It may be interesting to describe in a few words the old-fashioned bee-hive oven and the newer retort oven.

The bee-hive oven takes its name from its interior having the shape of the old dome-shaped bee-hive. The size is generally from 8 to 12 feet in diameter and from 6 to 8 feet high. The coal is charged through a hole in the top and is spread evenly over the floor to a depth of 18 to 28 inches. There is as much space left over the coal for the burning of the gases as is occupied by the charge of coal. The brick work of the oven being still hot from the heat of the previous charge, soon causes the fresh charge to ignite and distill off the gases, which are burned in the dome above the coal. The heat being reflected downward causes the distillation to proceed gradually toward the bottom of the coal. When all the gas is driven off, which takes from 48 to 72 hours, the coke is quenched while yet in the oven.

The bright glistening surface of Connellsville coke is principally due to this quenching inside the oven, and the columnar structure is due to the gas rising vertically as the coking proceeds downward. Blackheads are the lower portions of the charge that rest on the floor of the oven and which are not thoroughly coked.

As in this method of coking the only product obtained is the coke, and owing to the combustion taking place in the oven itself the yield of coke is generally somewhat less than the theoretical, owing to the combustion of a small quantity of the fixed carbon of the coal.

The retort oven is a closed chamber from 15 to 24 inches in width and from 5 to 8 feet in height, and from 25 to 45 feet in length. From 25 to 50 of these ovens are placed in a battery. The coal is charged through three or more openings in the top and leveled off to within a foot of the roof, after which the oven is carefully closed and sealed in order to exclude the air. The oven is heated by the combustion of a portion of the gas driven off in the process of coking. This is not burned in the oven itself, but is burned in flues constructed in the walls of the individual ovens. The heat is conducted through the walls of these combustion flues to the charge of coal, and distillation thereof is started immediately. The gas which is driven off is conducted through a series of apparatus in which the tar and ammonia are recovered, after which a portion of the gas is returned to be burned in the oven flues and the balance is disposed of as local conditions determine.

Distillation proceeds from the side walls toward the middle of the oven and the gas is probably driven toward the center of the oven, where it rises, forming a cleavage plane the whole length of the oven. When the process is completed, which takes place in from 20 to 36 hours, depending upon the width of the oven and the temperature maintained, the whole charge is pushed out by a steam or electric ram and is immediately quenched. The oven is at once closed, and without any loss of heat from the oven itself, is again charged with coal.

On account of the cleavage plane through the center of the charge, no piece of coke can be longer than half the width of the oven. Owing to the complete exclusion of air there is no combustion in the oven, and as the temperature of the oven when the coal is charged is very high, there is a considerable decomposition of volatile matter, with consequent deposition of carbon upon the coking charge; as a result the yield of coke is a little higher than the theoretical yield as calculated from the analysis of the coal. Quenching the coke outside the ovens mars the appearance of the coke, somewhat destroying its bright silvery luster, but probably results in carrying off an appreciable quantity of sulphur.

It is evident from a comparison of these two methods that coke made from the same coal will have a slightly higher percentage of fixed carbon and a slightly lower percentage of ash if made in a retort oven. The bee-hive oven is almost universally located at the mines from which it draws its supply of coal. Retort ovens are located in places that provide a market for the coke and gas. To allow a continuous operation of a retort-oven plant the product must be sold as fast as made, and to do this a uniform quality of foundry coke must be maintained.

The quality of retort-oven coke depends upon the skill of the operator, upon the method of preparing the coal, and, more than all, upon the quality of the coal used.

Our experience with retort-oven coke began during the fall of 1901. We were at first induced to try one car, and when it arrived it was so black and in such small pieces and looked so badly that we refused to try it in a cupola, but the makers proposed to pay for all poor castings, and under these conditions we used it in the same proportion as the Stonega bee-hive coke that we had been using previously. The iron was very hot and satisfactory.

We ordered five cars more, and ordered retort-oven coke from other ovens, until we decided that the coke worked well in spite of its very bad appearance. From that time to this we have never had a pound of other coke. All through 1902 the coke was so uniform and satisfactory that we melted 9 pounds of iron with 1 pound of coke.

There is a great advantage in having a local retort-oven coke plant, because it enables the founder to keep in close touch with the source of his supply. Owing to the necessity of having a laboratory at a retort-oven plant to keep track of by-products, the coke manufacturer keeps himself informed as to the chemical composition of his coal and coke and can make a very uniform product. Such local coke plant will have a very large variety of customers, and therefore can supply the founder with a very uniform quality of coke, because any inferior coke can be sold to domestic users or to manufacturers where it will do no harm.

Experience has proven that with a retort oven satisfactory foundry coke can be made from coal that when coked in a bee-hive oven would be unfit for foundry use. This helps the founder in that it greatly widens the field from which he can draw his future supply of fuel. Retort ovens are at present being erected in various cities, and I understand that an 80-oven plant will be in operation in Milwaukee in a few months. This will be a great relief to the founders of this city.

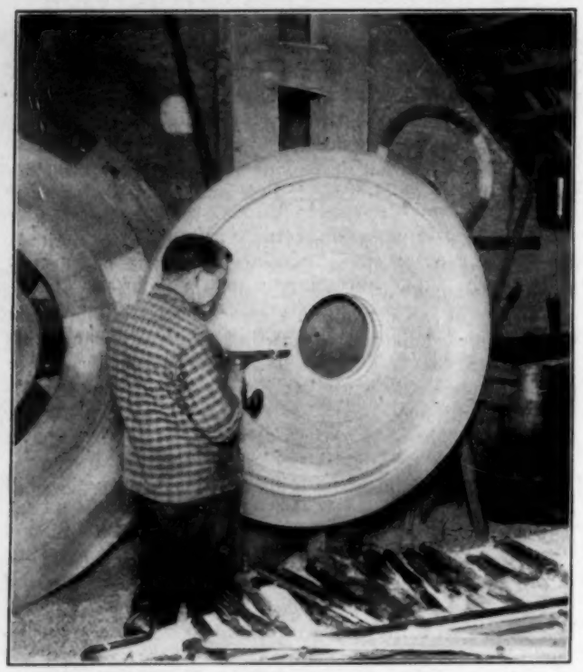
*Read at the Milwaukee meeting of the American Foundrymen's Association.

Baron Von Rheinbaben, Prussian minister of finance, Moritz Boeker, of Remshid, Germany, government iron and steel expert; F. Von Versen, United States Deputy Consul at Berlin; G. D. Waetzoldt, attache of the German consulate at New York, and J. P. Hand, of J. P. Morgan & Co., New York, have been spending the past week visiting industrial plants in the Central West. Special attention is being given to iron and steel plants and the development of commerce by means of inland waterways. A number of plants in Cleveland were visited Friday, and the visitors were entertained by Senator Hanna. The party visited Chicago and spent Saturday at Niagara Falls inspecting the great power plant.

Organization, Maintenance and Management of a Modern Pattern Shop.

BY JOSEPH LEON GOBEILLE.

In no department of metal founding is so large a proportion of the outlay wasted and so little care and sense be-



SHOWING PRACTICAL WALL FACE PLATE LATHE FOR LARGE WORK. THIS ONE WILL SWING UP TO 22 FEET IN DIAMETER.

stowed, as in the pattern shop. This being axiomatic we shall simply discuss remedies and improvements.

The building is important; the plant and the placing of the tools more important and, most important of all, the system of work and management. The building must be light throughout—no dark centers as in a square room. It should admit of supervision in its entirety from the foreman's table and be not too wide to permit of doubling up men on a big pattern—a matter of some moment on a hurry job. The shop should be a single-story detached building, or if storage is needed, have the shop on the top floor, with plenty of light, and with good heating by hot water system. Have sanitary arrangements and fixtures of the same quality as you would order for your own home. Pure water, ice and the best castile soap should be provided free, and a room set aside and furnished with bandages and other things needed in "first aid" emergency. A 4-inch stand-pipe should be erected with a Y to which are connected coils of 2-inch hose for use in case of an incipient blaze. Of course no fire will be allowed anywhere in the shop. Your glue pots will be heated by steam and your artificial light must be electric.

Your lumber room is constantly replenished with air-dried ready-to-use lumber. This lumber should be stood on end, i. e., the planks racked vertically, turning each end for end every ten days. Now that lumber is so large an item of expense, careful grading will be necessary. White pine is still preferable even at the price, but maple, poplar and white wood can be substituted in places, especially for segments and framing.

In the shop referred to in this paper the lumber room is at one end of the first wing (drawing shown), and the varnishing room in the same position on the other wing and the tools are placed so as to permit of consecutive operation from start to finish, thereby saving time in retracing steps and rehandling material.

A combination rip and cross-cut saw comes first; next in line a 24-inch jointer to get one side of the plank true and out of wind; then the planer to reduce to the required thickness. See that the band and jig saws are next in line; then the segment machine and various lathes. In placing machines pay particular attention to "clearance." A cross-cut saw must admit of one foot being sawn off from either end of a 16-foot plank without collision with another tool, operation or workman. A jointer or rip saw must allow for working up to 16 feet long and 24 inches wide under similar conditions.

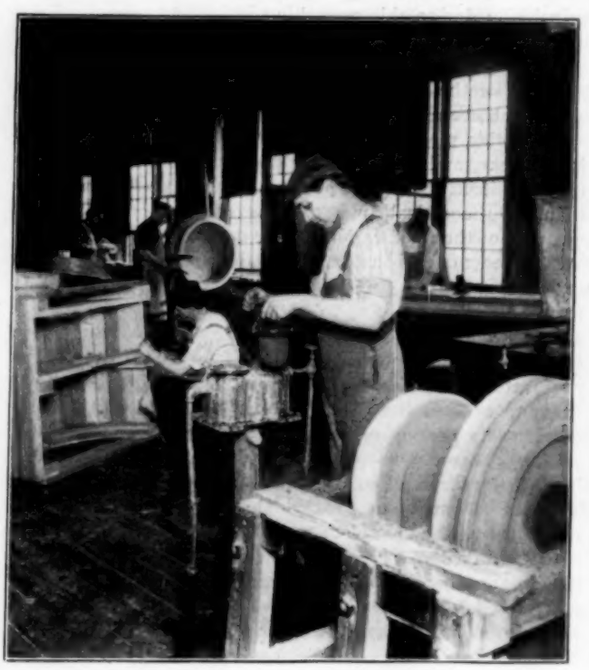
A large cast iron surface plate is very handy for starting frames, housings, or any large work which must be absolutely level. I believe the hand or bench trimmer is a detriment to rapid work and I have had as many as fifty in operation only to be finally abandoned. A better device is the power face plate with plain angle gauge. I cannot name the best tools of course; but some of the best advertised saws, lathes, etc., are unsatisfactory.

There is no good glue pot on the market. I have designed a twin steam pot which is all right if connected with a sewer to draw away the product of condensation; it is operated by live steam and admits of one pot being used on a job or on the bench without the cooling of the other, an important trifle.

A segment machine is a great time saver. A boy at $1.25 per day will "lay up" and glue 100 courses of six segments each for a day's work—about what eight journeymen would do on shute-boards at 35 cents an hour. No such machine is on the market. So I have made a photograph and a model of the table for assistance in understanding it. Of course, if you make only a few gears you will need a gear cutter. There are none on the market; we had to make ours, which is the only one I know of that actually turns out either involute or epicycloidal gears, without skilled labor to handle it. Any bright boy can run it. It is thought to be worth 50 cents an inch of "diameter plus face" to make teeth in hard wood for ordinary spur gearing by skilled hand-work at 40 cents per hour; and this is honest and perhaps exceptional output. This machine will cut gear teeth for 2 cents an inch.

A core box machine is a money saver. There is one on the market which is pretty near perfection.

There is no larger jointer on sale than a 24-inch. I have found that 40 inches is a low limit and some day shall



SHOWING TWIN GLUE POT WHICH ADMITS OF ONE BEING KEPT IN CONDITION WHILE THE OTHER IS IN USE ON A BENCH OR PATTERN.

cut our patterns to make a 60-inch. In large turned work, especially when laid up on a segment machine, a big jointer will surface courses for a fraction of the cost when done on a lathe, the usual way. If your foreman has the

practice of doweling his segments—a commendable habit—then you need a dowel machine. A good one costs only about $50.

There is nothing so good as a wooden fillet, but leather and lead are cheaper.

A flexible shaft suspended above your housing table with, say, five sizes of round rose cutters, will work the finest fillets in a pattern you ever saw, and do it out of the solid. The same rig makes a good sand-papering machine for curves and corners.

Three grindstones are absolutely necessary, one medium—and one fine-grain, flat and in perfect condition for planes, chisels, etc.—one medium-grain for gouges and curved blades.

A planer bit grinder, automatic saw set, brazing kit and an air-brush varnisher will about complete your inventory of necessary tools.

In a certain shop of which I have some casual knowledge, the system is as follows:

The superintendent is a mechanical engineer graduate of a technical school, who never made a pattern or cut a chip in his life. He is held responsible for the putting of the work into the shop. It must be laid out right, go to the proper gangs and be satisfactory as to plan of construction, i. e., best and latest method of molding, and if steel, extra risers or wings if necessary to subdue abnormal shrinkages. Every different pattern for a steel casting is a new problem. The assistant superintendent is a first-class pattern maker, thirty-six years of age, who is held accountable for getting the work out of the shop at right cost and in the promised time.

This shop is run in a combination of groups of specialists. The gangs contain seven men each—mill, dimension, assembling, finishing and varnishing gangs. The assembling and dimensions gangs are duplicated many times, one gang making nothing but beds, frames or housings; another steam, air and hydraulic cylinders; a third, intricate cored work, as valves, injectors, etc.

The gang boss gets $5 a day. If he severs his connection with the company for any cause, a new man is elected from the gang to take his place. The gang has one vote, the superintendent one, and the body of gang bosses one vote. This man thus chosen, though receiving only, say, $3 a day, is immediately raised to $5 and is privileged to name the "tail man" to fill out his quota. This new man receives $1.75 and is usually a relative from some foreign country, generally a cabinet maker or joiner and often a

BOY OPERATING GEAR CUTTER. LESS THAN TWO CENTS PER INCH, DIAMETER AND FACE. INVOLUTE OR EPICYCLOIDAL TEETH.

fine mechanic who develops into a gang boss himself in time.

Once each week the superintendent, assistant superintendent, all the gang foremen, the electrician, and the machine man, together with the president of the company, get together for conference. At this meeting all troubles are adjusted. Absolute free speech prevails. If a gang boss has a hunch to advise the removal of the president or the superintendent to Hades, that is his right and he exercises it with impunity and without prejudice. As every gang boss thinks he is discriminated against, in the matter of workmen, it is a chance to fix things up and

SHOWS STAGGERED TANDEM PLAN. PLANE WORKS TO JOINTER THEN BACK TO PLANER WHICH IS TO THE RIGHT OF SAW. BRINGS STUFF BACK TO STARTING POINT, SAWED TO SIZE AND PLANED TO THICKNESS.

make exchanges. For example, an A. P. A. and a Roman Catholic, a free silver and a gold man, do not get good results side by side; both spend valuable time in argument, are unhappy and discontented, so they are best separated and put into different gangs.

Each gang boss signs a receipt to the gang below for his material. If the stock is insufficient, or in error in any way, he has no redress; but his gang must make it good in its own time and at its own cost so far as labor is concerned. Sometimes a gang boss will pass up a defective bill of work maliciously, to avoid "making good," but if the next boss does not discover the error he gets no sympathy, for the assistant superintendent tells him it "serves him right if he can't check up his own stuff." In this particular shop the varnishing gang is composed of women and girls. They are experts and earn an average daily wage of $1.25. They are twice as effective and ten times as well satisfied as the men, whose places they filled and who received $2.25 per day of ten hours.

It will be apparent to you that this gang system dispenses with skilled pattern makers in some gangs to the amount of one-half or more. In the mill gang there need be but one pattern maker; only two or three in the dimension and assembling gangs; not one in the turning gang, in which there are seven men and only six lathes. Each man runs his own special lathe and no other, while the gang boss neither toils nor spins; he earns his 50 cents per hour and has it just as easy as if he were a walking delegate.

The purpose of this paper is to be suggestive and helpful. Many of you have not steady work for enough men to pay you to run a large shop, as pattern work is never constant; it is either a "feast or a famine." But suppose, say, three concerns, right here in Milwaukee, should join forces and run a pattern shop in common, of only 25 men, then the organization might be something like this:

A committee of five, one from each joining company with the superintendent and clerk of the pattern shop *ex-officio*. This committee to meet weekly and plan the placing of the work on an equitable basis. You have in

addition to superintendent 24 workers. These should be divided into four gangs of five men each, viz:

A mill gang, which shall get out rough lumber, plane and saw, but not dimension.

Dimension gang, which shall put the mill gang product into lengths, shapes and fitness.

Assembling gang, which shall build this product into the pattern form.

Finishing gang, which takes care of rounds, fillets, dowels, draw and rapping plates, sand papering, etc.

You have four men left. Two will do the turning; one on small, one on large work; the other two will varnish and put on the symbols and lettering.

Gentlemen: I have endeavored to be frank and simple with you. The question of cheap patterns is one of organization, truly no secret or mystery. I have told you all I know about it, which is not a terrible sight. My final request is that you will consider my effort of no importance, and let things go as they are; for you are paying on an average about 50 percent too much for patterns

MR. GOBEILLE'S SEGMENT TRIMMER WHICH HAS A CAPACITY OF 125 COURSES OF SIX SEGMENTS EACH FOR A DAY'S WORK.

made in your own pattern shops, which is a beautiful margin for me to work on.

An example of the application of gas engines to central station service is afforded by the new plant of the Franklin Electric Co., Franklin, Pa. The gas power equipment will supplant a large steam plant which the company has in operation at the present time, and will supply current for electric light and power service throughout the city. The present equipment comprises five 125-h. p. Westinghouse vertical 3-cylinder gas engines, which will be belted to a corresponding number of 75-k. w. alternating current generators. An interesting feature of the equipment is the provision made for the operation of the alternating current generators in parallel. This has proven to be a very difficult matter up to the present time in gas engine practice, and is made possible in the Westinghouse engines by the method of governing characteristic of this engine. The plant operates upon natural gas fuel.

The King unloading machines on the dock of M. A. Hanna & Co., Ashtabula, have been laid up a few days for repairs. The breaking of an extension arm indicated that the construction was not sufficiently strong to handle the two-ton grab buckets with which the machines were equipped this spring, and work was ordered stopped until the construction could be strengthened.

PERMANENT MOLDS.*

BY JAMES A. MURPHY, ERIE, PA.

The casting of large work is at all times an interesting topic to foundrymen, particularly so in loam, when specially well contrived rigs are involved. The art of loam molding has reached a wonderful degree of perfection in some

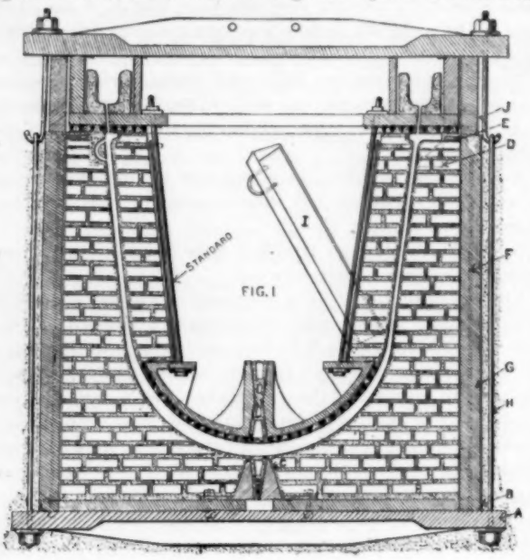


FIG. 1

sections of this country, and the best minds are directed to the saving of as much as possible of each mold in order to reduce to a minimum the cost of all castings after the first. In other words the permanent mold is the object sought. It is a common argument against loam molding that its cost is too high, and I have no doubt that this is true when work is made in loam that should be made in sand. As a rule those whom I have found prejudiced against loam on account of its cost knew so little about it that I could not consider them competent judges.

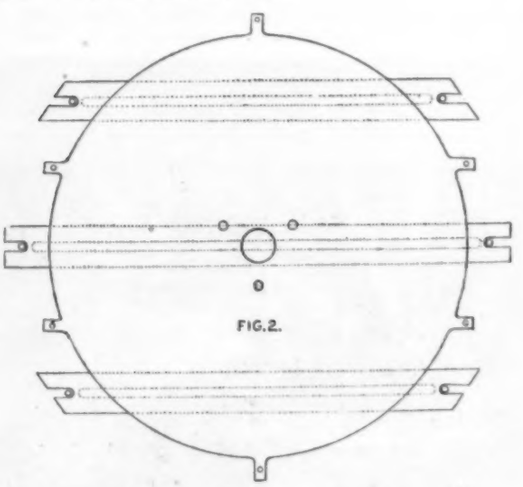


FIG. 2.

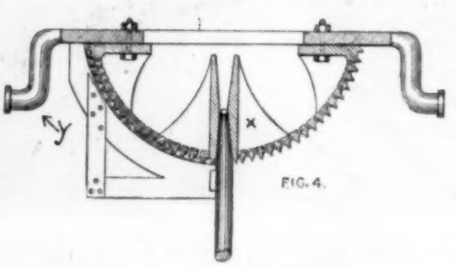


FIG. 4.

Large kettles, such as shown in Fig. 1, pans, domes pipes, etc., are cheapest made in permanent loam molds. In some instances iron casings would still be cheaper. There are shops that make such castings in sand, but I

*Read at the Milwaukee meeting of the American Foundrymen's Association.

consider them not up on the modern way of doing things. This kettle weighs about 14 tons and is made very quickly when the proper rigs and equipment are available. The mold is absolutely permanent, the only preparation necessary being the daubing on of the loam, blacking it, and as the bricks are hot when in use a small fire placed inside of it will dry it thoroughly in a few hours. The core is

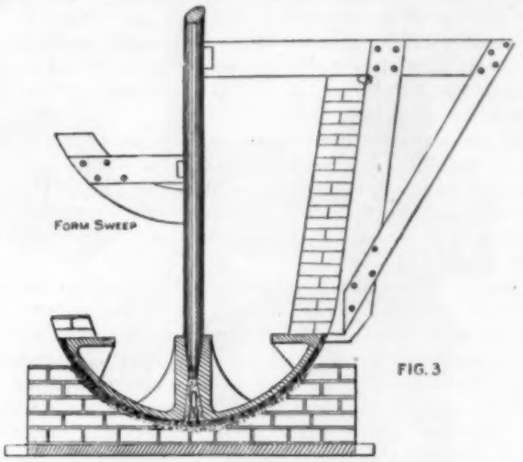


FIG. 3

swept up and is preferably dried in an oven. The whole core can be made of iron staves, but I consider the rig shown with the greater part of the core laid up with brick the quickest, safest and most satisfactory method.

To start the job we must dig a pit in the floor in some convenient place and have the binders A and bottom plate B (Fig. 1) made and set, as well as the spindle step C in which to set the mold sweep (Fig. 6). Bricks are then laid to the outline allowing from ½ inch to ¾ inch for loam. If the bricks are not of good quality it is best to have the face of the mold laid with fire bricks, using the common ones for backing. When built up to within about a foot of the top it is best to get on the octagonal lines and on their centers build in eight iron frames (Fig. 7 and D Fig. 1) with liberal draft. In these can be set cores for handles, brackets or other external projections and when the casting is taken out the wall will not be in the least disturbed.

On top of the wall lay a strong cast iron ring (Fig. 8 and E Fig. 1) recessed on the octagonal lines sufficient to clear the iron boxes just mentioned, leaving space enough on top for a face of loam on the joint. This when bolted down firmly (F. Fig. 1) to the bottom plate will prevent

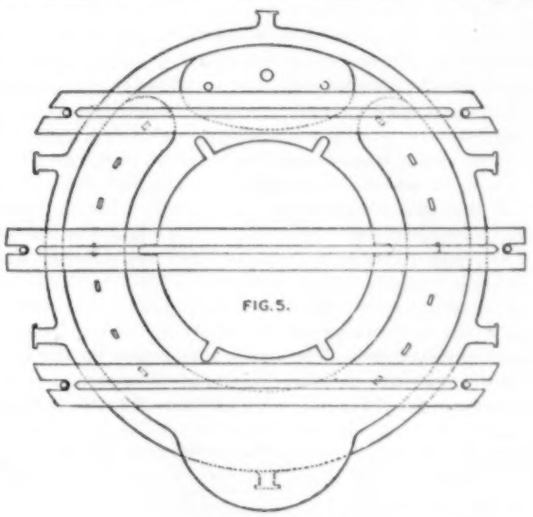


FIG. 5.

the loosening of a single brick. The brick part of the mold being finished, the columns G and bolting rods H are placed and the nature of the soil would have to determine whether a curbing was necessary or not before ramming up the mold permanently. Plenty of fine cinders should be used between the brick work, bringing all the gases to the outside of the wall quickly where provision should be made to convey them away.

For the core it is best to make one or more crown plates (X Fig. 4) and I consider the one shown an improvement on any similar "get-up" that I have seen. It is cheapest and best when swept up in loam with a straight hole cored through its hub, which can afterwards be machined to suit the taper of the spindle. It can be laid on

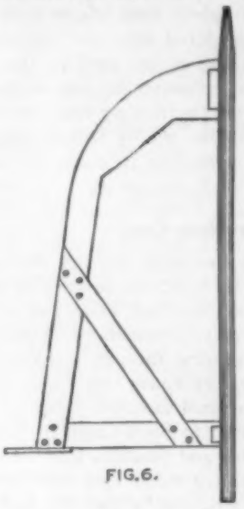


FIG. 6.

FIG. 7.

the roll-over plate (Y Fig. 4) spindle set in and plumbed true, loam rubbed on, swept and finished; when hardened with a fire basket it can be turned over set in the form as shown in Fig. 3, spindle set in the other side and the building of the core proceeded with. To provide for shrinkage and prevent extra labor and save some bricks from being badly broken, it is handy to build in a splitting bar (I Fig. 1), which can be easily pulled away with the crane after pouring, allowing the wall to give with the contraction of the casting.

When the core is built, an iron lifting ring is secured on top of it, and by means of this it is set on a form similar to Fig. 3, on the oven carriage. When dry this is taken away and the flat top plate J lowered on it and the core bolted securely to it. The whole thing is lifted by the top plate and closed by the center lines. I prefer running this on top similar to the way shown, each gate being stopped until the runner is full. Risers left open to relieve the pressure of air, prevent the back kick and thus obviate the wrinkles that would mar the appearance of the casting, particularly so if the metal

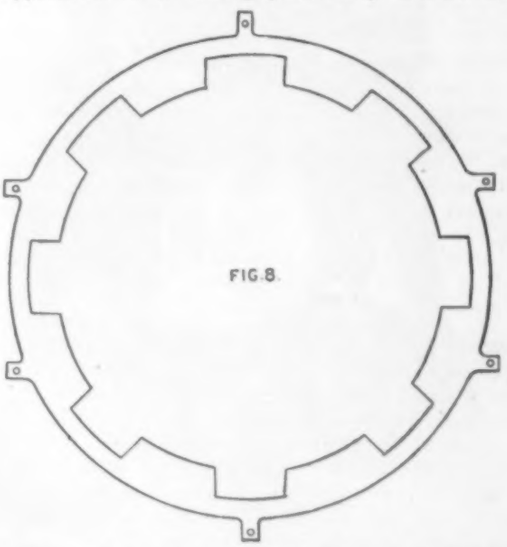


FIG. 8.

was not very hot. The riser basin should be ample and be so arranged that it can be flowed off to take away the metal from the runner so as not to have a heavy piece of scrap to break.

The mold is thoroughly secure and not much more costly than if only one casting was intended to be made. As shown it will last for several years' continuous service.

Any shop equipped for large work should, with a rig of this kind, turn out one of these kettles every few days. As thus arranged it is seldom that a first-class workman need be put on the job, everything being made to prevent possible mistake by other than the grossest carelessness. It is, however, advisable for the foreman to keep an eye to starboard in any case, as I recollect a case where after everything was seen to and considered safe, the unlooked for happened. It seems that a bag of hay used by the molder as a seat for the ladder was forgotten by him in the mold at the last moment, of course the casting was lost by having a large hole in its bottom, all of which makes one wish that the molder had forgotten to come out also.

Cranberry Iron Ores.

"Iron Ore Deposits of the Cranberry District, North Carolina-Tennessee" is an abstract from the descriptive next by Arthur Keith, of the Cranberry Geologic Folio, just published by the U. S. Geological Survey. Deposits of magnetic iron oxide occur along a line passing through Cranberry in a northwestern direction. They begin near Old Fields on North Toe River, and extend, with small intervals, south of Smoky Gap through Cranberry and on to Shell Creek in Tennessee. The ore has long been worked and produces iron well known for its purity. At the Cranberry mines open cuts have been made at intervals over an area 900 by 300 feet and to the depth of 250 feet, with branching tunnels running in for considerable distances. The ore occurs as lenses dipping southwest. The ore is very free from phosphorus and sulphur. It yields an average of 42 to 46 percent of iron. The quantity of ore is more or less uncertain, though the deposit has apparently a length of over half a mile. Large quantities are now in sight, and a large output is to be expected in the future. Red hematite is found in this area on the east side of Bull Ruffin Mountain. Little work has been done in the development of the ore, and its value and quantity are questionable. Specular hematite is found along the south slope, and also north and northwest of Beech Mountain. The veins are small or of only moderate thickness. Brown hematite ores are abundant in the Tennessee district.

The Consolidated Press & Tool Co., builder of presses, dies, sheet metal tools and special machinery, 96-100 N. Clinton St., Chicago, announces its establishment to engage in the above line of manufacture. The officers are: Chas. S. Burton, president; H. C. H. Walsh, vice president and factory manager; Geo. F. Lee, treasurer, and T. J. Potter, secretary and business manager. Mr. Walsh, the vice president, has spent 20 years designing and building sheet metal tools, having been with E. W. Bliss Co., Brooklyn, N. Y., and later manager of the G. A. Crosby & Co. machine shop of the American can Co. T. J. Potter was connected with Rudolphi & Krummel, builders of presses, dies and special machinery up to the time of the purchase of their plant by the American Can Co. and until recently was manager of the machinery sales division of the latter company.

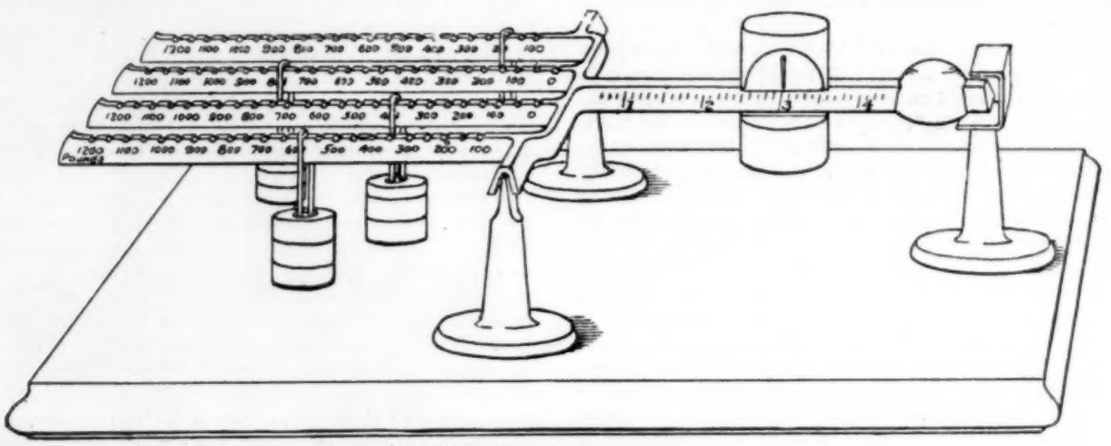
DEVICE FOR GUAGING SILICON IN AN IRON MIXTURE.*

BY ARTHUR W. WALKER, BOSTON, MASS.

The device consists of a balanced scale, having a single beam on one side of the fulcrum, as shown in the sketch, and any number of beams on the other side. In the illustration there are four of these beams, which are shown on the left of the supports. For the scale beams on the left side, small weights are used, each weight representing a certain kind of iron, and the weight being varied to represent the percentage of silicon contained in the iron which it represents.

In the scale which we are using each ounce in the left-hand weights represents 1 percent of silicon, and the weights can be arranged by adding weights of various amounts, so that they will correspond to the percentage of silicon in the various irons used, each weight representing one kind of iron.

Having arranged the weights in conformity to the percentage of silicon in the various irons, the weights are placed in position on the left-hand scale beams in accordance with the quantity of each iron which it is intended to use. The instrument we are using is designed for a net ton, or 2,000 pounds. As shown in the sketch the weight on the front scale beam is set at 600 pounds, indicating that for that particular iron it is proposed to use 600 pounds in a net ton. On the second beam the weight is set at 400 pounds, indicating that 400 pounds of that iron will be used. On the next beam the weight is set at



DEVICE FOR GUAGING SILICON.

800 pounds, and on the rear beam the weight is set at 200 pounds. It will be noted that these weights make 2,000 pounds in all. Having placed the weights in conformity with the proposed mixture, the right-hand weight is moved along the scale, until it balances the left-hand weights, and when the right-hand weight exactly balances the others, its position on the scale indicates the average silicon. From this may be deducted the expected loss in silicon (say one-quarter of 1 percent) or the right-hand weight can be made to allow for this without any figuring whatever.

It is obvious, of course, that the instrument may be used in the opposite way from the above, setting the right-hand weight at the silicon desired, and then adjusting the left-hand weights until they balance, remembering that the total must always be 2,000 pounds for the left-hand weights. If it is desired to ascertain the mixture in a charge larger or smaller than 2,000 pounds, it is only necessary to change the large weight on the right-hand beam. In the device we use, this weighs ten ounces, and for a charge of say, 1,200 pounds, it would be changed for one weighing six ounces.

There is, of course, no objection to placing two or more of the weights on the left-hand scale; indeed, a single scale on the left would serve for all the different weights used; it is thought that the use of a number of scale beams makes the device easier to use and understand. This instrument can also be used to determine the average of any other element in the iron.

*Read at the Milwaukee meeting of the American Foundrymen's Association.

A NEW CUTTING-OFF MACHINE.

This machine cuts off stock up to 3½ inches in diameter. It uses a saw 10 inches diameter, 1-16-inch thick, which

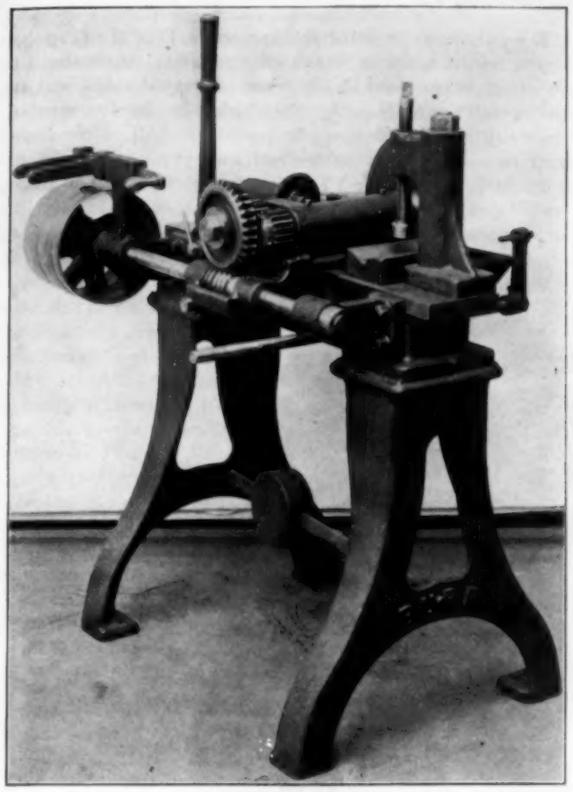


FIG. 1.—BACK VIEW OF NO. 1 BAR COLD-SAW WITH GRINDER IN PLACE.

runs in an oil bath. The saw is fed into the work by gravity, the weight being placed close to chain when saw is sharp and run out on lever as saw dulls.

The saw carriage has a substantial bearing on bed and is gibbed in place. A stock stop enables the operator to cut off any number of pieces exactly the same length without measuring. After a piece has been cut off, carriage is pushed back by the lever and latches at the extreme position, allowing operator to open the vise-screw and readjust the stock in the vise for a new cut. The latch is then thrown up and the saw allowed to feed in for the new cut.

The driving mechanism has the pinions of machinery steel, worm-wheel hobbed and coarse pitch steel worm, provided with ball thrust bearing and running in oil.

The worm is feathered to the driving shaft, which is driven by 8-inch by 2-inch tight and loose pulleys, running 500 revolutions per minute. One of the pulleys has a double crown, for the saw-grinder belt. The saw grinder, furnished with each machine, will grind the saw in about 10 minutes. The saw-slide on the grinder is furnished with adjustable in and out stop, so that each tool will be ground the same depth. It is also provided with an adjustable tooth gauge, keeping the pitch of the teeth accurate.

The stock vise may be removed from the bed if desired and special fixtures used for cutting up special forms.

The machine weighs about 400 pounds, packs in case 20 inches by 36 inches by 36 inches. It is built by John T. Burr & Son, of Brooklyn, N. Y.

The autumn meeting of the Iron and Steel Institute will be held at Barrow-in-Furness, Eng., Sept. 1-4. The program will embrace visits to the works of the Barrow Hematite Steel Co., Ltd., the shipyards of Vickers, Sons & Maxim, Ltd., the iron mines at Hodbarrow, and the Millom & Askam Iron Co.'s works.

CRAMP SHIPBUILDING CO'S REPORT.

The annual report of the Cramp Shipbuilding Co. for the year ended April 30, 1903, shows a surplus after dividends of $179,198, an increase over the previous year of $36,362. The income account for four years compares as follows:

	1903.	1902.	1901.	1900.
Gross	$8,518,169	$8,202,093	$7,319,000	$2,791,560
Expenses	7,821,672	7,415,946	6,576,000	6,878,560
Net	$ 696,497	$ 786,147	$ 743,000	$ 913,000
Fix. charges, etc.	396,099	400,911	451,228	376,738
Surplus	$ 300,398	$ 385,236	$ 291,772	$ 536,262
Dividends	121,200	242,400	242,400	242,400
Surplus	$ 179,198	$ 142,836	$ 49,372	$ 293,862

The profit and loss account at the end of the year amounted to $4,322,803, compared with $4,143,606 the previous year. The plant is valued at $12,577,821, and the total assets are fixed at $15,531,405. The total liabilities, including the $4,848,000 of capital stock, are $11,208,602. That leaves a surplus in assets of $4,322,803. During the year the vessels completed had a total tonnage of 70,174. In reference to the $5,000,000 5 percent loan recently made the report says: "For the purpose of enabling the company to carry out the terms of the agreement a special meeting of the stockholders of the company will be held upon the 25th day of June next to vote for or against an increase of the capital stock of the company from $5,000,000 to $6,250,000, and of the mortgage indebtedness from $1,800,000 to $7,500,000."

The blast furnace of the Franklin Iron Furnace Co., Franklin Iron Works postoffice, Utica, N. Y., went out of blast June 1 for the purpose of relining the stack and making other necessary repairs. The furnace will be out of blast about two months.

The directors of the Dominion Iron & Steel Co., Sydney, have decided to issue $1,500,000 additional stock in

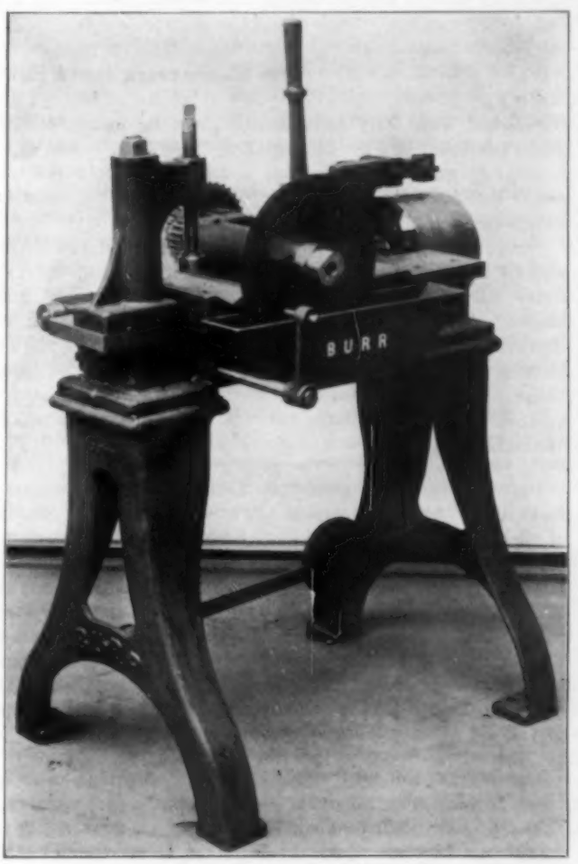


FIG. 2.—NO. 1 BAR COLD-SAW WITH GRINDER DETACHED.

order to complete the plant of the company. The entire amount will be underwritten by the directors.

A LATHE WITH "NORTHERN ELECTRIC" MOTOR.

The lathe shown in Figs. 1 and 2 is a recent equipment of the Northern Electrical Mfg. Co., of Madison, Wis. It is a 16-inch Springfield lathe with a 1½-horsepower Northern direct current motor. The speed and feed variations are accomplished with forty intermediate steps, by means of the motor controller and the lathe gearing. The lathe is of a type familiar to our readers, but has a special headstock for the motor attachment. The design of the headstock is clearly shown by the half-tones.

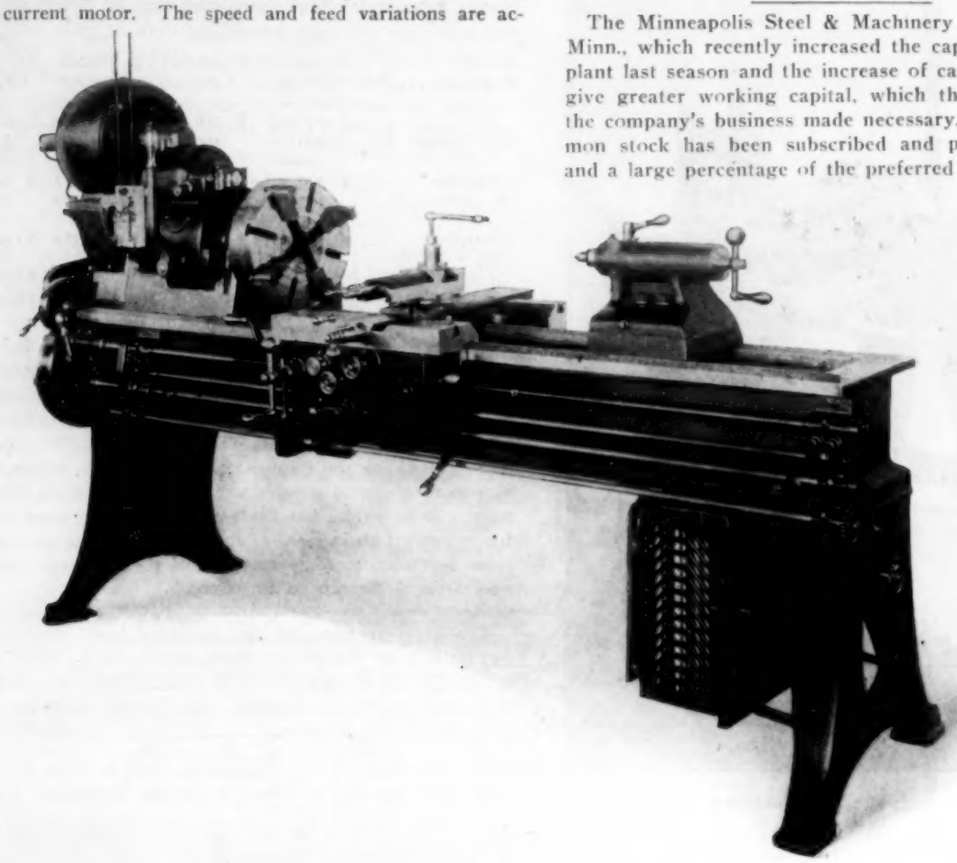


FIG. 1.—NORTHERN MOTOR DIRECT-CONNECTED TO SPRINGFIELD LATHE.

The controller is placed under the bed at the end, out of the way of the workman. This is an upright shaft, at the extreme left of the apron, and is geared to a splined rod running the length of the lathe bed. The upright shaft is operated by a handle and on turning the spindle rod in this manner a sprocket wheel on the controller is actuated by a chain. The speed is thus under perfect control of the lathesman at any position of the carriage. The elevated position of the motor places it out of the way of chips, etc.

The Alabama & Virginia Iron Co. has been organized at Russellville, Ala. The capital stock is $51,000. The officers of the company are: President, A. J. Phillips, Portsmouth, Va.; Charles E. Wilson, Russellville, Ala., vice president; J. W. Brown, Jr., Norfolk, Va., secretary and treasurer; Wm. S. Douglass, Florence, Ala., general manager. The company will develop iron mines in Franklin County, Alabama, and if the mines develop as well as expected, will build a blast furnace. An iron furnace was built and operated in this locality ninety years ago, and was in operation in 1812. The parts of the old plant still standing are covered with moss.

The number of men employed at the American Car & Foundry Co.'s plant at Jeffersonville, Ind., is to be reduced July 1st. The plant now employs about 1,300 men and it is not known how many will be laid off. It is reported that similar action will be taken at other plants of the company.

The Wood Iron & Steel Co. has been formed with a capital stock of $3,500,000. It is the consolidation of the Alan Wood Iron & Steel Co. and the Alan Wood Co. The business was established in 1826 and was first incorporated in 1886. The directors are: Jonathan R. Jones, Howard Wood, Richard G. Wood, Alan W. Wood, of New York City, and William W. Lukens, of Philadelphia. The company is building a plant at Ivy Rock, Pa.

The Minneapolis Steel & Machinery Co., Minneapolis, Minn., which recently increased the capital stock, built a plant last season and the increase of capital stock was to give greater working capital, which the development of the company's business made necessary. All of the common stock has been subscribed and practically paid in and a large percentage of the preferred stock. The company carries on a large structural iron and bridge business in addition to which it has a separate department engaged in the manufacture of Corliss engines and transmission machinery. At the time the company was organized, a year ago, it absorbed the old Twin City Iron Works, Minneapolis, whose engine and machinery business is being conducted on the same lines as before, but on a very much larger scale. The company is now building an addition to its office, and outside from this, will do no building this season, but will put in some additional equipment which has already been contracted for.

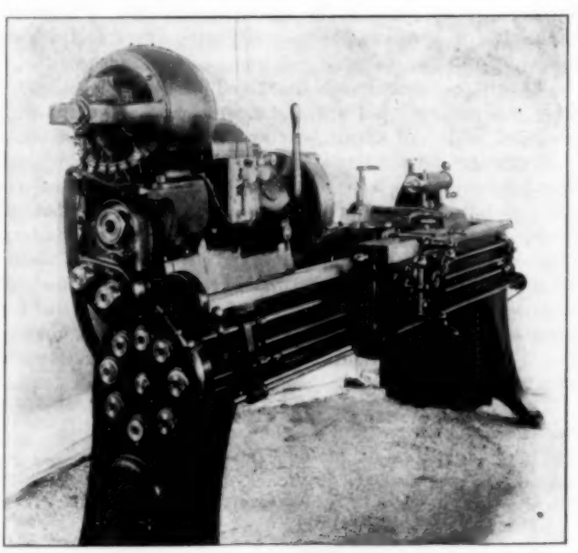


FIG. 2.—ELECTRICALLY-DRIVEN LATHE.

MALLEABLE CAST IRON.*

BY DR. RICHARD MOLDENKE, NEW YORK.

Whatever may be the scientific definition of a malleable casting, for commercial purposes it is one made of iron of special composition and rendered malleable by subsequent annealing. The composition of the hard casting lies between well-defined limits, and it is affected by so many conditions that the successful production of this class of work is one of the most difficult branches of the iron industry.

While nominally the composition of a good malleable casting is but little different than that of a car wheel or a roll, yet the fact that it can be twisted, bent and hammered out hot or cold and has double the tensile strength of these products, shows that the constitution of the castings is quite different. This difference in the constitution may be traced to the condition of the carbon in each. In the ordinary gray casting we may have some 3 to 3½ percent graphite present. In the malleable casting we have the same amount, weighed as graphite in the analysis, but radically different in its characteristics. This form of carbon due to the annealing process has been called temper-carbon by Prof. Ledebur, who first described it in connection with the malleable (Ger. "temper") process. I will mention one of the peculiarities of this form of carbon. If a malleable casting which on fracture shows the fine black velvet surface, is heated up very high and then plunged, all this amorphous carbon is dissolved, and the fracture shows the grain of a good tool steel. The same is often seen when a piece is hammered cold, and more especially when a casting that has become warped is heated up and straightened. The grain in the latter instances will not be as good as in the first one, but it shows that to straighten a malleable casting no heat, and preferable pressure only, should be applied. This characteristic of the carbon is often used to palm off malleable castings as steel ones, much to the disgust of the user and the producer of bona-fide "malleable."

Of the properties of the malleable casting, it may be said in general that the tensile strength should run between 42,000 and 47,000 pounds per square inch. Castings showing only 35,000 are still quite serviceable for ordinary work. It is not advisable to run much beyond 54,000 pounds per square inch, for the resilience is reduced, and one of the most valuable properties of the malleable casting impaired. I have made much work running up to 63,000 pounds, by the plentiful addition of steel to the mixture in the open-hearth furnace. I do not, however, recommend this, as wherever such high results are wanted, they can best be obtained by using the steel casting direct.

As an instance of what can be done with malleable castings I will mention a series of tests made with bars of small and large diameters, which were heated and carefully drawn out under the hammer. While the interior, or high carbon portion was badly cracked up, the surface was of such a fine material that in one sample the tensile strength actually ran up to 123,000 pounds per square inch.

The elongation of a piece of good "malleable" will lie between 2½ and 5½ percent measured between points two inches apart. The thicker the piece, the smaller the elongation.

In making the transverse test, the deflection of an inch square piece, resting upon supports 12 inches apart, should be over ½ inch, the breaking weight being at least 3,500 pounds. Very soft iron often deflects 2½ inches under this test, but this is exceptional and may not be reproduced continuously.

The high resilience, or resistance to shock, in "malleable" is its most useful characteristic. It is well known in railroad circles that the ordinary steel casting comes nowhere near the malleable for service conditions. Only where an exceedingly high tensile strength is required, as in the car couplers for the heavy modern trains, is the malleable casting being gradually replaced. On the other hand, car castings, formerly made of gray iron, are now specified for malleable wherever possible, in the interest of greater strength and reduced weight. When we remember that the present production of malleable castings is at the rate of 650,000 tons per annum, and at least half of this goes into car construction, the importance of the industry may be properly gauged.

In spite of this enormous production, there is really little information available outside of the foundries most interested, and it may as well be said, also very little within. The founder is not going to increase the difficulties in his sales if he can help it, and the inspecting engineer, not being able to check the process from his own understanding, cannot act as intelligently as he really should. The American Society for Testing Materials is, however, at present at work on this very thing, and we shall soon have a set of specifications governing the production of these castings where good qualities are essential, which will insure better work all along the line.

Composition and Structure of Malleable Castings.

Before going into the composition of good "malleable," it is necessary to look a little into its structure. Originally cast to be perfectly chilled, that is with the carbon all combined, and a contraction of some ¼ inch to the foot; the annealing process serves to expel the carbon from its state of combination, depositing it between the crystals of the iron, not in the crystalling graphite of the gray iron, but as an amorphous form not unlike lampblack. At the same time an expansion equal to half of the original contraction takes place, the net result being a shrinkage allowance for the pattern identical with that for gray iron castings of similar shape and thickness.

Beside this expulsion of the carbon from its combination, there is a removal of some of it from the outer portions of the casting. This amounts to nearly all in the skin to nothing ¼ inch inward. I do not take kindly to the generally accepted theory that oxygen from the packing penetrates the casting, removing the carbon by burning it out. I have always found that when oxygen has access to the interior, through the open structure of the iron itself, this is also oxidized with the carbon, and the whole presents a sorry sight. Whether, however, carbon diffuses out or not, in a good casting, I cannot say, and hope that this point will some day be taken up and settled by careful experiment.

It will be noted that owing to the removal of varying amounts of carbon from the skin to the interior no carbon determination of a malleable casting is of any value, unless the sample is taken before the anneal, and even then it is only good for the total carbon. For an annealed piece a sample taken from the center of the fracture with at least ⅜ inch untouched around the drill would give a fair indication of the carbon contents, but cannot claim accuracy.

In former days of charcoal iron about 4.00 percent carbon was the rule in malleable castings. In these days of coke irons and steel additions to reduce the carbon, this may run as low as 2.75 percent before trouble ensues in the anneal, if not already in the foundry through excessive cracking and shrinkages. With the modern demand for a high tensile strength it is well to place the lowest limit at 2.75 percent and the upper limit for common work would be found in the saturation point of this grade of iron, or 4.25 percent. It is absolutely necessary that the hard casting be free from graphite; even a small amount of this indicates an open structure with consequent ruin to the work in the anneal from penetrating oxygen. To keep the carbon in the combined state is the function of the silicon percentage arranged for in the mixture, the rate of cooling due to the cross section, the pouring temperature, sand, etc.

The sulphur contents is quite important, especially just now when we are getting the sweeping of the coal mines for our fuel to a greater or less extent. The percentage should not be allowed to go over .05, though double this may let a casting pass muster where good work is of

*Read at the Milwaukee meeting of the American Foundrymen's Association.

no special object. Once the sulphur exceeds .05, trouble may be expected. It is therefore wise to hold the pig irons below .04, and to see that the fuel used is not too rich in sulphur.

Manganese is seldom troublesome, as it does not often exceed .40 in the mixture, which means .10 to .20 in the casting. Above .40 in the casting it begins to give trouble in the anneal and therefore manganese as a general proposition should be kept low.

Phosphorus should not exceed .225, and is better kept below this.

To get the proper silicon limit for the class of castings you have to make is the trick which means either success or failure for your foundry. This will be realized from the fact that you do not know how your castings will come out until about a week after they went into the anneal. Now suppose your mixture is wrong, and the silicon is either too high, which means "low" or rotten work, or too low in the castings, making them "high" (strangely contradictory but nevertheless shop terms in daily use and dating back to the times when silicon was unheard of in malleable works). This means hard burnt white castings stronger than the first mentioned class, but equally undesirable. You will not know of this until a whole week's work, in all probability equally bad, has been placed into the ovens, and comes out in its turn only to wander into the scrap pile. Naturally disaster stares the inexperienced founder of malleable castings in the face all the time, and only a good laboratory will keep him out of hot water, everything else being equal. It also shows the necessity for better protection to the buyer who cannot be supposed to distinguish between a good and only fair casting.

In general we may say that the thicker the casting, the lower the silicon allowable in order to get a white iron in the sand. Thus for the heaviest classes of work, the silicon of the casting should not exceed 0.45. For ordinary work .65 is the point to be sought for. Agricultural work may run up to .80, while the lightest casting may have 1.25 percent without danger, though it is not advisable to exceed this limit for anything.

Our American practice differs from the European in several respects. We have a comparatively short anneal, that is we aim at a conversion of the carbon rather than its removal. Over there it is desired to get all carbon out, so that a wrought iron casting, if it may be so called, may result. With much of the iron cast from crucibles, it is quite possible to make very fine grades of work, and this may account for higher prices for malleable than steel castings paid in some parts of Europe. Imagine, however, what would result if we had the crucible processes here, with our average production of some 35 tons daily in the larger plants, or some 80 in the very large ones.

The common American practice is to use the reverberatory, or "air" furnace, either with or without the top blast over the bridge to hasten the melting. There is always a blast introduced under the grates, unless indeed in our older works, the chimney draught is exceptionally good.

The Use of the Open-Hearth Furnace.

About 12 years ago the open-hearth furnace was introduced into one of our largest works, and it was my good fortune to gain experience with it there. While not many malleable establishments have the open-hearth furnace (I can count them on my fingers), yet it is undoubtedly the most economical melter there is, provided several things. One is that is must be kept busy as much as possible, as only then its full economy is taken advantage of. Then skilled workmen must be kept in charge. This does not mean the steel melter with his habit of letting the heat take care of itself, and tapping a ten-ton heat five hours after charging, whereas it should come out in two hours and a half. But it means a man who will use his muscle freely to rabble up the heat, push the pigs into the bath as quickly as they can be cared for, mix his iron well, fire sharp and quick so that the process becomes one of melting only, rather than a refining or burning out of large quantities of silicon and carbon. When these conditions prevail, the open-hearth will prove a friend indeed and turn out a most excellent product.

Let us take fair conditions with three heats daily from a 10-ton open-hearth furnace. Using producer gas the fuel ratio is about one of coal to six of iron. In the reverberatory furnace the fuel ratio is one to four at best, and often only one to two. It is not advisable to make larger heats than 15 to 18 tons, as the time consumed in melting, and especially in pouring from the small ladles after tapping, becomes so great that the bath is seriously damaged by undue oxidation and overheating. When the time comes for continuous melting in the malleable foundry, when heat after heat is taken off as fast as the bottom can be patched up and the furnace charged again, then will the complete economy of the open-hearth furnace be fully realized. We may then also see the tilting furnace of value to us, though a device of my own, which I am using successfully in my own interests, and which allows the tapping from three spouts at different levels, successively, has the advantages of the tilting furnace for "malleable" without incurring the heavy first and running costs.

For making malleable castings, the open-hearth furnace should be pushed very hard for a time almost sufficient to collapse it, then it should be checked before actual damage is done to crown and ports. In this way a short, sharp heat is obtained, the silicon of the heat may be calculated for a loss of twenty to twenty-five points whereas from thirty-five upwards is the rule in other processes. Three hundreds heats should be taken off before repairs of several days' duration are required, and a total of at least 1,000 heats only should necessitate practically a rebuilding with but little loss other than the refractories.

In the meantime there has been much improvement in the air furnace. Strange to say, while the quantity of metal, the composition, excepting only in the phosphorus content, of the large roll and the malleable casting is the same, the air furnace used in each industry has been developed on different lines. In making rolls we find the short high reverberatory chamber, more on the lines of the copper furnaces, while in the malleable industry the furnace is long, very low, and contracted at the stack entrance. While formerly the hearth was practically rebuilt after each heat, at the present day several heats are taken off before a new bottom is made. The bungs, of course, always suffer, and herein the crown of an open-hearth is much more easily cared for. But the poor efficiency of the fuel is an inherent difficulty which cannot be overcome, and presents new difficulties with every change of quality.

At the present time there is a general difficulty with the coal used, which means castings with an undue amount of sulphur. These castings are weak and will some day wander into the scrap pile. When the next slump comes we will be confronted with a serious condition. This high sulphur scrap will come into the market, in fact forced upon the founder wherever his castings can be identified. They will be hard to use by him, and from the fact of high sulphur will not be available for basic steel, as was the case formerly. There is then a neat problem, and one which will make the fortune of anyone who may discover an economical remedy, and that is the removal of sulphur from iron on a commercial scale. I present this to our experimenters and wish them success with it.

Cupola Malleable.

The cupola still turns out a considerable tonnage of malleable castings, but this process will be gradually superseded by the furnace method, chiefly on account of the better grade of work turned out by the latter. There is, however, one interesting point connected with the cupola process, or rather with cupola iron, which we must go into more fully in connection with its bearing upon the anneal. Cupola iron requires some 200 degree F. more than furnace iron to anneal it properly. This is a general proposition. It seems strange that it should be so but possibly the structure of cupola iron is so close that it requires more effort to get the crystals apart and to effect the liberation of the carbon from its state of combination. Whether this

is due to the contact of the metal with the fuel as it trickles down in thin streams and drops is hard to say, but the difference certainly exists, and must be provided for in the anneal.

Naturally with a higher degree of heat the wastage of the annealing pots is more marked, and the process becomes more expensive in this regard also, for our annealing boxes must be reckoned as a dead loss which is to be diluted as it were by as long a life as possible in the ovens.

Annealing.

In studying the annealing process we find two extremes leading to about the same results so far as the carbon change is concerned. A short anneal at a very high heat is as effective as a comparatively long anneal at a much lower temperature. That is to say, we can anneal, or rather change the carbon in a casting, by placing it over night in a melting furnace which has been let cool below the melting point of the iron, or do the same thing in the annealing oven at a much lower temperature but giving it a week's time. Of the two methods the latter is by far the preferable, as it not only permits the change in the carbon, but also gives the carbon time to get out. Then again the chances of burning the castings in the anneal are obviated. The result is a good, reliable casting, while in the hurry-up processes one never knows whether they are annealed at all. Sometimes they are and often they are not. Malleable founders, therefore, while experimenting for generations on short annealing lines, have come to recognize that the best all around and safe method is to arrange matters so that an oven may be regularly recharged on the same day of the succeeding week.

We may describe the annealing process by a curve which runs up quickly, remains horizontal for a short time, and then drops very gradually. That is a sharp heating up, in the shortest safe time possible, then a shutting off of the dampers and maintaining of the temperature evenly for a period of say two full days at least, and then a gradual cooling down to at least a black heat before dumping. Here is where mistakes are often made, annealing pots being drawn red hot because some particular casting is wanted badly. The castings are red hot when the air touches them, the delicate reaction of the carbon is disturbed and an inferior material results. I have always had softer, more malleable iron from the anneals which had the extra Sunday to become cold in the oven, and were cold when dumped on Monday morning.

An oven can be brought up to heat as quickly as may be, the fuel waste to do this being alone considered. In cities where the smoke problem exists, more time is required than in the open country. For a fair sized oven at least 36 hours are required to bring it up to heat (a pyrometer should always be used to test this), and then it should be held there.

As to the actual temperatures there is this much to say. Furnace iron of average thickness must have received over 1250 degree F. after coming up, until cutting off the heat, to be safely annealed. Perhaps even then some of the work must be put back for another anneal. A safer limit is 1350 degree F., and no more is necessary. This temperature must exist in the coldest part of the furnace, or usually at the lower part of the middle in the front row pots. As a rule the upper space of an oven is some 200 degrees F. higher than this, although I have succeeded in building ovens in which there was but a difference of 100 degrees F. throughout the whole interior space, the temperatures being measured with a LeChatelier element 20 feet long.

Translating these temperatures we find that 680 degrees C. is the lowest point for successful annealing of furnace iron, while 780 degrees C. is the safest one. For cupola iron the temperature should be about 850 degrees C.

If we contrast former times with the present, in the malleable industry, when charcoal irons only were supposed to chill, when immense piles were kept at the command of some melter who had inherited the art of looking wise over the test plug, where would we have been today when the importing of foreign irons is the order of the day? In dollars and cents the benefit of science to the much neglected foundry industry has been incalculable, and perhaps the malleable foundry has received the greatest share, as it needed it most.

I cannot refrain from again calling attention to the fact that only education, and hard work to use this education properly, will allow us to hold the supremacy we have now wrested from industrial Europe. We must place our brightest young men in the technical schools, our apprentices in the evening and trade schools, and our children in manual training schools. Let those who have the making of future captains of industry be properly trained, and they will save many years of mistakes and wasted effort. Let the poor boy who wants to better his prospects in life be given the opportunity to enrich his store of knowledge. He will then see something ahead, and in times of trouble stand by his employer for justice and an unrestricted opportunity to receive full value for any increased output resulting from his skill and ingenuity. The foundry is a good place to study industrial conditions, and our hope for the future of the Nation lies in the education of our young men.

No Sign of Hard Times.

H. J. Martin, vice president of the Pacific Hardware & Steel Co., San Francisco, in a letter to the New York *Commercial* says:

"Business is very good; the prospects for continued activity in all lines and in our line especially on this coast leave nothing to be desired. There has not been the slightest cessation of demand for steel products. In fact, all the subsidiary companies of the United States Steel Corporation are increasing the capacity of their plants and yet they cannot keep up with the demand. Plates are sold a year ahead of production and the pressed steel car companies are taking the entire output of the only two concerns that would otherwise be in a position to deliver plates in less time.

"I have just returned from Europe and the East, where I have been studying the situation. As it looks to me, when the steel plants attain their full capacity, which they may be reasonably expected to do within the next two years or three at the most, they will have so cheapened their methods of production that when the home demand slackens, they will be in a position to reach out for foreign markets and ship boldly to Europe and South Africa. If the Orient should quicken into life at about the same time, then undoubtedly American steel would rule the markets of the world. The present importations of billets from Europe and the utilization of other foreign material are merely temporary conditions arising from the fact that our power of producing manufactured steel has for the moment not kept pace with the demands of the country for finished steel products. I think it would be extremely hazardous for anybody to order a very large amount of such material in Europe at present, for the work of cheapening the production of steel is steadily going on in the steel plants of the Eastern and Middle Western states, and it must be remembered that it takes at least a year after the order is given before European steel can be delivered.

"Trade conditions will continue to improve steadily for the next year anyway and prosperous times promise to continue until the next presidential election. I think that is as far ahead as anybody ought to be asked to prophesy."

Opponents of the reorganization plan proposed for the United States Shipbuilding Co. have issued a circular appealing to bondholders generally not to deposit their securities with the committee and to organize for their own protection. The circular is issued over the signature of Gustave Loeb, of New York City, who says he has already communicated with a number of bondholders, and has found they are of the same opinion as he is. The burden of the complaint is that gross deception was practiced upon prospective purchasers of the bonds at the time the company was organized and, to make the affair worse, these investors are now asked to surrender their first lien upon the shipyards to the holders of the collateral trust bonds, who are already favored with a first mortgage upon the Bethlehem Steel Co.'s properties.

The Inefficiency of the Standard Lathe for High-Speed Cutting.*

BY H. M. NORRIS.

It is the object of this paper to demonstrate the inefficiency of the standard lathe for high speed cutting.

During the discussion of one of the papers read at our last meeting I stated that for turning shafting with Novo steel the gradation of speeds on the standard lathe is far too rapid, that there should be less difference between successive cone steps, and that for work between 1 and 4 inches the ratio of back gears should be approximately 2 to 1.

This statement, you will recall, was disputed by each of the subsequent speakers, which would indicate that perhaps I was too hasty in giving voice to my thoughts. One or the other of us must be wrong. My lathe is either an improvement on the standard lathe, or it is not, and it is to decide just such questions as this that these meetings are held. The machine tool industry is an old one. We are all apt to get into ruts. No one can excel in all departments of a manufacturing establishment. Each of us has his own ideas on a subject, and when these ideas are at variance, it is through discussion only that we are able to determine which of them it is well to adopt. There can be but one best way to accomplish an object. We may at times argue at cross purposes. Our view points may be different. One member may think that that lathe is best which has the largest spindle, the longest bearings, or the deepest bed, while another may be of the opinion that that lathe is best which enables him to machine the largest variety of work. If a lathe is to be operated in the hold of a ship, or in one's cellar, its usefulness is in direct proportion to the variety of work it is capable of handling; but where a lathe is to be used for manufacturing a staple article its usefulness is measured—not by the variety, but by the volume of work it is capable of handling.

TABLE 1.—CUTTING SPEED IN FEET PER MINUTE AT MOMENT TOOL WAS DESTROYED.

CUT.	FEEDS.			
	1/64	1/32	3/64	AVERAGE.
1/16	326	320	381	342.3
1/16	425	360	327	370.6
1/16	339	354	330	341.
1 Average	363.3	344.6	346	351.3
3/32	326	230	262	272.6
3/32	268	268	209	281.6
3/32	332	285	227	281 3
2 Average	342	261	232.6	278.5
1/8	336	259	231	275.3
1/8	326	260	220	268.6
1/8	310	267	240	272.3
3 Average	324	262	230.3	272.1

In Cincinnati we are largely specialists, which enables us to put our work through in large lots. It is expedient, therefore, that each operation should be performed under the maximum speed the nature of the work will permit, as whatever percentage of time can be saved on one piece can be saved on the entire lot. It's an old saying that if one looks after the pennies the dollars will look after themselves. So it is with machine tool building. Keep down the cost of the individual operation, and the cost of the finished product will take care of itself.

None of us is infallible. A member may think he has something good, which under the search light of investigation is found to possess little or no merit. We are too prone to pass snap judgment. I think, therefore, that every suggestion should receive the most careful consideration before being either accepted or rejected. If anyone has a good thing we all want it; if he hasn't we should show him his mistake. We come here to learn the truth, and I see no reason why we should not get it.

The first question I asked myself in taking up this subject was: What is it I want to learn? The answer was, "How to remove with a Novo tool the greatest amount of metal in the most economical manner." If a shaft is to be reduced a quarter of an inch, should it be done in one cut, or in two cuts; should we use a fine feed, or a coarse feed; should we operate at a periphery speed of 150 ft. or at 300 ft.? The tool will stand so much and no more. What is this "so much?" It is reached at a speed of 10 feet less than that at which the tool is runined, or at a speed of 20 feet less? It is probable that the lasting qualities of a tool depend upon the amount of heat that is generated at its cutting edge. If this is true it is also probable that the life of the tool is shortened with every increase in either speed, feed or depth of cut. But which generates the more heat, a deep cut under a fine feed or a shallow cut under a coarse feed? If we can settle this point, the question will resolve itself down to a matter of periphery speed. Of course the tools will vary, as will also the material upon which they operate, but by making all the tests upon shafts cut from the same bar and repeating each three times with different tools, we should be able to obtain a line on at least one of the laws that govern high speed cutting. This, then, is obviously our starting point, and inasmuch as the average run of our work will not permit our taking a cut in which the cross section of the chip is greater than 1/8x3-64 our tests had best be confined to cuts of 1-16, 3-32 and 1/8 in depth by 1-64, 1-32 and 3-64 in thickness. The question, therefore, is to find the maximum speed at which a tool will operate under each of these cuts. How can this be determined? If we had a sufficiently powerful variable-speed countershaft, the speed could be increased as the cut advanced, but how would we know at what speed we were running at the moment the tool gave way. We know that a Novo tool will stand a speed of 180 feet. So we might run a minute at 190, another at 200 and another at 210, etc.; but the cuts would hardly be of sufficient duration to prove much. Then, too, having 27 tools to ruin it would consume too much time. But what is the objection to operating on a conical shaft? The tools will probably be destroyed at a speed between 200 and 400 feet. This means that the large end of the shaft would have to be twice the diameter of the small end. If the length is kept within 24 inches we can use a taper attachment. I will try it.

TABLE 2.—CUBIC INCHES OF METAL BEING REMOVED PER MINUTE AT MOMENT TOOL WAS DESTROYED.

CUT	FEEDS.			
	1/64	1/32	3/64	AVERAGE.
1/16	3.822	7.502	13.40	8.241
1/16	4.982	8.440	11.50	8.307
1/16	3.974	8.299	11.60	7.957
1 AVERAGE	4.259	8.080	12.166	8.168
3/32	5.732	8.089	13.821	9.214
3/32	6.471	9.425	11.025	8.973
3/32	5.838	10.023	11.975	9.278
2 AVERAGE	6.013	9.179	12.273	9.155
1/8	7.8785	12.144	16.274	12.0898
1/8	7.643	12.192	15.473	11.769
1/8	7.268	12.52	16.88	12.222
3 AVERAGE	7.597	12.285	16.203	12.0269

Having finished my theorizing, we had made from the same bar of 15 point carbon steel six taper shafts the remains of one of which you see before you. Upon five of these shafts we operated dry with the result shown in Table 1. It will be noted that the maximum speed of 425 feet was obtained when taking a 1-16 cut under a feed of 1-64 inch per revolution, and the minimum of 209 feet when taking a 3-32 cut under a feed of 3-64 inch per revolution. The first is probably higher than normal and the second lower—although not to the same extent as the first—but they are both valuable figures to have, in that they show the danger of drawing conclusions from single tests. If we reject this test of 425 feet, column No. 1 would indicate that the periphery speed was independent of the depth of cut, while columns 2 and 3 indicate that the speed should be decreased as the depth of cut is increased. So also with the feeds. Line 1 appears to indicate that the speed is independent of the rate of feed, while lines 2 and 3 indicate that the speed shall be decreased as the feed is increased. These figures were obtained by multiplying the indicated speed of the lathe spindle during the cut by the circumference in feet of the shaft at the outside edge of the shoulder made by the tool being tested, and are therefore absolutely reliable. If now we multiply each

*Read at the Milwaukee meeting of the American Foundrymen's Association.

of these figures by the sectional area of the chips we obtain the number of cubic inches of metal that were being removed per minute at the moment the tool gave out. These products vary from approximately 4¼ to 12 cubic inches per minute, as shown in Table II, and are all in favor of deep cuts and coarse feeds, which disposes of our original question very effectually.

We next took six cuts under water to determine how much faster we could operate than when turning dry. These cuts were ⅛ deep by 1-32 wide, and gave the results shown in Table III, the average of which is less than 10 percent higher than the average speed attained under the same conditions working dry. And I am not at all sorry the gain is so slight, for had it been found that water added much to the efficiency of the tool we would all want to use it, notwithstanding the annoyance and expense we would be put to in

TABLE 3.—CUT ⅛ X 1-32 INCH WET.

272	
275	
305	
301	
258	
315	

having to provide suitable means for carrying off the water. But as it is we will be satisfied with the lower speed.

Our next experiments, Table IV, were made dry on a straight shaft with a view to testing the durability of the tools under a constant speed. These cuts were all ⅛ deep by 1-32 wide, and developed the fact that it is necessary to operate at a much lower speed when removing scale. They show, also, that satisfactory results can be obtained at a speed within nine feet of that at which the tool is ruined; which answers another of our questions and illustrates the advantages of small increases between successive spindle speeds.

Other conclusions reached during this series of expertments can be summarized as follows:

1. That a tailstock center made of Novo steel is much longer lived than the centers furnished by the manufacturers.
2. That after a tool has been burned its end should be cut off at least a 16th inside of the burnt portion.
3. That white chips do not indicate that a tool is operating at less than its maximum speed.
4. That each successive cut on a shaft permits of a higher cutting speed than the previous one.
5. That while water may be beneficial as a check on the expansion of the work its other advantages are too slight to warrant our using it in general practice.
6. That until such time as means are devised for compensating for the expansion of the work it is inexpedient to operate on the average grade of steels at a speed greater than 175 feet per minute.

TABLE 4.—CUT ⅛ X 1-32 INCH DRY.

Speed.	Diam.	CONDITION OF TOOL.	REMARKS.
149½	3½	Ruined in 11 inches.	Scale.
151	3½	" " 12 "	"
173	3¾	Uninjured in 26¾ inches.	
199	3	" " 26¾ "	
208	2¾	Ruined in 4½ inches.	
208	2¾	" " 8 "	

Next in order for consideration is the question of how to avail ourselves of the high efficiency of these tools. None of our shafting is larger than 4 inches, and little of it smaller than 1 inch, so if a cutting speed of 175 feet per minute is the maximum speed at which we should intend to operate, it will be unnecessary for the lathe spindle to run faster than 668 revolutions per minute, or slower than 167 revolutions per minute. Grading the speeds between these limits gives us the series shown in Column 1, Table V, which enables us to turn the diameters given in Column 3, at the cutting speed shown in Column 2, none of which is as much as 10 percent lower than the desired speed of 175 feet. These 12 speeds are obtained by means of a 3-step cone the diameters of which are 11 7-32, 12 9-32 and 13 inches, a back gear made in the ratio of 2.13 to 1, and a 2-speed friction countershaft. Width of belt, 4 inches.

Compare the efficiency of a lathe made in this way with one of standard design, an 18-inch lathe, said to be the latest product of one of the best known concerns in the country. Its five-step cone has diameters of 4, 6, 8, 10 and 12 inches, and the back gears are in the ratio of 12.35 to 1. The width of belt is 2½ inches. The speeds on this machine are shown in Column 5, Table V, and to my mind require but a glance to convince one of their unsuitableness for high speed cutting. They are as unfit to produce economical results as a blind man is to read a micrometer or to scrape in the platen of a milling machine, and how any one can claim that they are all right is beyond my understanding. It has been shown that the maximum speed need be but four times faster than the minimum speed, while on this machine the maximum speed is more than 111 times the minimum speed. If, therefore, the lathe is speeded so that its maximum speed will cut a 1-inch shaft at the rate of 175 feet per minute, it will obviously require a diameter of 111 inches to maintain the same cutting speed when running at the minimum speed—which is rather a large piece to swing in an 18-inch lathe. And what is true of the lowest speed is true of six of the others. We see, for instance, that there are but three speeds adapted to work between 1 and 4 inches in diameter, that a 3⅛-inch shaft has to be turned at the same speed as a 4-inch, a 1⅞ at the same speed as a 3, and a 1⅛ at the same speed

TABLE 5.—COMPARISON OF EFFICIENCY OF TWO TYPES OF LATHES.

Revolutions per minute.	Cutting Speed.	Diameter.	Cutting Speed.	Revolutions per minute.
668	175	1	175	668
589	174	1⅛	109	371
520	170	1¼	121	371
458	165	1⅜	134	371
404	159	1½	146	371
404	172	1⅝	158	371
356	163	1¾	170	371
356	175	1⅞	110	223
314	164	2	117	223
314	175	2⅛	124	223
276	164	2¼	131	223
276	172	2⅜	139	223
243	159	2½	146	223
243	167	2⅝	153	223
243	175	2¾	161	223
214	161	2⅞	168	223
214	168	3	175	223
214	175	3⅛	110	134
190	162	3¼	114	134
190	168	3⅜	118	134
190	174	3½	123	134
167	160	3⅝	127	134
167	165	3¾	132	134
167	170	3⅞	136	134
167	175	4	140	134
.....	.....	5	175	134
.....	.....	9	175	74
.....	.....	12⅜	175	54
.....	.....	22¼	175	30
.....	.....	37	175	18
.....	.....	60½	175	11
.....	.....	111	175	6

as a 1¾. Now let us see what this means to us in the course of a year if both lathes were kept employed on 1⅛-inch work. Allowing 55 hours to the week and 50 weeks to the year makes a run of 2750 hours. Taking wages at 20 cents per hour, and general expense at 25 cents per hour, makes the output of each lathe cost .45 x 2,750, or $1,237.50. Assuming the selling price of this work at 1¼ times what it cost to produce on an ordinary lathe, gives us a return of 1¼ x $1,237.50, or $1,546.88, which we will call the market price of 109 finished shafts. This brings us to the following proposition: If a lathe operating at a cutting speed of 109 feet per minute turns out 109 shafts per year, how many shafts per year can be turned out on a lathe operating at a cutting speed of 174 feet per minute? If we disregard the time consumed in handling the work, the answer is 174 shafts, or 59.6 percent more than can be turned out at the lower speed, in which event we would receive for the year's output 1.6 x $1,546.88, or $2,475.00. The cost, however, remains as before, but instead of profits being but $1,546.88 — $1,237.50 = $309.38, they are $2,475 — $1,237.50 = $1,237.50, or more than four times as large.

This, however, is an extreme case as the average cutting speed on our special lathe is but 22 percent more efficient than the average cutting speed on the standard lathe, so at such times as the lathes are employed on a variety of diameters it is not likely that the profits on the product of the special lathe would be more than twice those earned on the product of the standard machine. But all of this is based on the as-

sumption that the standard lathe has sufficient power to remove a chip of the same sectional area as the special lathe. We were told at the last meeting that the belt on a 36-inch lathe driven by a 45-inch pulley slipped under a cut of 1-16 x 1-32, which would indicate that the standard 18-inch lathe will not begin to stand the cuts we can take on our special lathe. Why is this? How do we obtain so much more power? If we ask the builder if a certain lathe is powerful enough to perform certain work, he will answer: "Yes, it is geared in the ratio of 12 to 1 inch, or he will say: "It's the highest geared machine on the market, which gives it power to burn." What then can we expect from a lathe geared in the ratio of but 2 to 1? Let us see.

The maximum speed of both lathes is the same—each runs at 668 revolutions per minute. A 4-inch pulley running at this speed gives a belt travel of 699.53 feet per minute, which, multiplied by the width of the belt, gives a surface speed of 145.71 square feet per minute, as against a surface speed of 672.23 obtained from a 4-inch belt running on a 11 17-32 inch pulley. The surface speed of the one is to the surface speed of the other as 4.61 is to 1, so if both lathes are driven by belts of equal thickness the available power of the special lathe will be 4.61 times that of the standard lathe. It is a well known fact, however, that a heavy double belt will not operate to advantage on a 4-inch pulley. It is also a fact that a double belt will transmit 10-7ths. the power of a single belt, which increases the power of the special lathe to 6.59 times that of the standard lathe. Then, too, there is the gain due to the additional arc of contact. In the standard lathe this arc is approximately 133 deg., while in the special the arc is approximately 179 deg. which increases our power to 8.87 times that of the standard lathe. But how about the ratio of the back gears, asks the lathe builder. The back gears? What have they to do with it? Is there any combination of gears in the world that will enable a machine to perform more work than the belt supplies power for? Here, then, is where the lathe builder falls down. He knows that the greater the ratio the greater the cut, but entirely overlooks the fact that where power is obtained at a forfeiture of speed, the greater the ratio the greater the curtailment of profits.

The Cement Industry in 1902.

The Division of Mining and Mineral Resources of the United States Geological Survey gives out the following statement as to the production of cement in the United States for 1902. This statement is preliminary to the report on cement for that year, which is now in process of preparation.

The production of Portland cement amounted to 16,875,500 barrels; that of natural-rock cement to 9,083,759 barrels; that of slag or Pozzuolana cement to 478,555 barrels, making a total for the year of 26,437,820 barrels. The production for 1901 was 20,068,737 barrels, of which 12,711,225 barrels were Portland, 7,084,823 barrels were natural-rock, and 272,689 barrels were slag or Pozzuolana cement. The total gain of 1901 over 1900 was 2,837,587 barrels; that of 1902 over 1901 was 6,369,083 barrels. It may be of interest to note that in 1892, ten years ago, the total production of cement in the United States was 8,758,621 barrels, of which 8,211,181 barrels were natural-rock and 547,440 barrels were Portland. It will be observed that the gain of 1902 over 1901 is within 2,500,000 barrels of the total production of 1892.

Geo. H. Danner, Chas. R. Rall and Joseph K. Smith, announce that they have severed their connection with the Best Mfg. Co., of Pittsburg, and have organized the Pittsburg Piping & Equipment Co. to conduct a pipefitting, pipe bending and machine shop business and to supply brass and bronze castings for blast furnaces and rolling mills. Their offices are 1111-12 Westinghouse Bldg. and works at Thirty-fifth and Smallman Sts., Pittsburg.

Reports from Vienna state that miners and workmen in the iron districts of Australia are coming to the United States in large numbers on account of unprecedented stagnation of the iron industry. Many workmen have been discharged from iron works and wages of others have been largely reduced.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.

The 47th meeting of the American Society of Mechanical Engineers will be held at Saratoga, N. Y., from June 23 to 26. The headquarters will be established at the United States Hotel, and at the opening session there on Tuesday evening an address of welcome will be made by Albert L. Rohrer of the local committee, and a response by James M. Dodge, president of the society. Professional papers will then be read as follows: By J. M. B. Scheele, "The United States Army Gun Factory at Watervliet Arsenal, N. Y.;" R. P. Bolton, "Test of Hydraulic Elevator Plant;" John B. Blood, "Rational Train Resistance Formula." After this meeting an informal reception will be held for the members, visitors and ladies in the ball room, and there will be a smoker on the adjoining balcony.

The morning session on Wednesday will be in the first instance for the reports of tellers and committees, discussion of the proposed constitution, by-laws and rules, as per the report of the committee on revision of the rules and methods and general business. Until the hour of adjournment, the following professional papers may then be taken up: Charles M. Allen, "Turbine Flow Recorder;" John L. Bacon, "Some Data on Hoisting Hooks;" A. Bement, "Strains Produced by the Excessive Tightening of Nuts." Wednesday afternoon will be given to the presentation of papers by C. E. Sargent, "Indicating Anglemeter;" Stanley H. Moore, "Recent Practice in Forcing, Shrinking, Driving and Running Fits and Limits for Limit Gauges;" H. L. Gantt, "Graphical Daily Balance in Manufacture;" Fred W. Taylor, "Shop Management;" F. A. Waldron, "Steam Turbine from Operating Standpoint."

On Thursday morning there will be professional papers by E. A. Hitchcock, "Experiment Boiler of Ohio State University;" D. S. Jacobus, "Curves of Water Consumption for Various Horse Powers of Several Engines;" John McGeorge, "Drawing Office Equipment;" C. H. Benjamin, "Bursting of Emery Wheels." These will be followed by topical discussions. Friday afternoon the following professional papers will be read in Union College chapel at Schenectady: John Riddell, "A 60-foot Boring Mill;" Walter I. Slichtor, "Alternating Current Motors for Variable Speeds;" A. H. Eldredge, "Positive Governor Drives." The closing session will be held at the United States Hotel at Saratoga, and the reading of professional papers will be resumed as follows: C. H. Robertson, "Test of 12-Horse Power Gas Engine;" H. F. Halladay and G. O. Hodge, "Internal Combustion Engine Using Kerosene as Fuel;" E. C. Oliver, "Gas Engine Testing;" H. G. Manning, "Mechanics of Air Brake Systems;" A. H. Eldredge, "Hot Well as Oil Extractor;" W. F. Parish, "Comparative Oil Tests;" E. S. Farwell, "Test of 8-foot Blower."

An excellent program has been mapped out by the local committee. Wednesday evening there will be an entertainment by the Jest and Song Club of Schenectady; Thursday evening the usual reception by the president of the society and the officers of the local committee; Friday the society will be the guests of the American Locomotive Co. and the General Electric Co. at the Schenectady plants.

The Board on Classification of the United States General Appraisers has just rendered a decision defining the duty on cold rolled steel having been brightened or polished, which will result in an exaction of one cent per pound in addition to the rates to which unpolished or inferior steel is subject. The practice of the customs officials up to the present has been not to take into consideration for the purpose of assessing duty the condition of the exterior of these steel strips, but at the instigation of United States foreign customs agents, who placed certain information before one of the collectors of the port of New York, the extra rate was attached and upon protest the question was brought before the Board of General Appraisers. An appeal from the decision will be taken.

The Allegheny Forging Co., manufacturer of rivets and iron and steel forgings, announces the removal of its Pittsburg office to the Frick Building.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Flowery Branch Gin & Oil Co., Flowery Branch, Ga., is in the market for 75-horsepower right-hand wheel governor, automatic engine to run not over 200 revolutions, the band wheel for belt to be 44 x 14 inches in addition to flywheel; also wants 100-horsepower return tubular boiler.

Birmingham Boiler Works, Birmingham, Ala., wants 200 to 300 feet of 2½ or 2 7-16 shaftings and hangers for same.

Ham & Ham, California, Mo., want to purchase suitable machinery for zinc rolling mill and stamping machinery for manufacturing zinc tile roofing.

The Fairmont Steel Co., Fairmont, W. Va., recently incorporated under the laws of that state by T. J. Costello, Levi B. Harr, B. G. Williams, Clyde S. Holt, and W. J. Lafollette, has elected the following officers: John A. Clark, president; Clyde S. Holt, vice president; Walton Miller, treasurer; W. J. Lafollette, secretary; T. J. Costello, general manager. The capital is $100,000. The plant will be entirely new throughout, with all modern improvements for the exclusive manufacture of steel rails in standard sections from twelve to fifty pounds. The building is now in course of erection, contracts for machinery closed, and the plant will be ready for operation October 1.

The Toronto Laundry Machine Co., Toronto, Canada, has been incorporated with a capital of $40,000.

The Keystone Steel Pulley Co., Pittsburg, has been incorporated with a capital of $50,000 under the laws of Delaware. The incorporators are: E. F. Thompson, L. V. Hewitt, J. T. Wachob, H. C. McClure, J. T. Martin, D. Howard Brown, Willis H. Clark, all of Pittsburg; John B. Miller, A. D. Miller, R. B. Miller, A. D. Miller, Ill., all of Allegheny; Andrew S. Miller, Bellevue; George Ralston, Bellevue.

The Bowie Stove Co., Rome, Ga., has been incorporated with a capital of $22,000 to manufacture stoves and to conduct a general iron and woodworking business.

Swanger & McLain, dealers in plumbing goods, stoves, etc., at Marion, Ind., are organizing a company to manufacture steel ranges and stoves in that city. The company is to have a capital of $100,000.

W. H. Alford, formerly of Indianapolis, and William H. Parish, of Richmond, Ind., have formed a partnership for the manufacture of patent wire fence. A plant at Richmond will be equipped.

The Witte Iron Works Co., Kansas City, Mo., has increased its capital stock from $25,000 to $75,000; one-half the increase paid.

The Ft. Wayne Iron & Steel Co., Ft. Wayne, Ind., capital $175,000, has been incorporated. Mr. W. J. Moody, of Chicago, will be the president of the new company.

The Sour Lake Tool Co., of Sour Lake, Texas, capital $15,000, has been incorporated.

The Atlas Gas Engine & Trunk Co. has been organized at Portland, Me., with a capital of $350,000, of which $200. is paid in, to manufacture motors.

The Eastern Sheet Steel Works, 32 Cortlandt St., New York, capital $2,000, has been incorporated by D. V. Lyon, D. E. Van Orden and F. W. Richardson.

The Mathis Bros. Co., Indianapolis, has been incorporated with a capital of $130,000 to manufacture ventilating apparatus and electrical and mechanical devices.

The Reid-Wilson Mfg. Co., Chicago, capital $2,500, has been incorporated to manufacture metal specialties.

The Interlocking Fence Co., Morton, Ill., capital $25,000, has been incorporated to manufacture wire fence and gates and fence supplies.

The Los Angeles Tool & Die Mfg. Co., Los Angeles, Cal., has been incorporated with a capital of $5,000.

The Canton Drop Forging & Mfg. Co., Canton, O., capital $25,000; has been incorporated by Jas. T. Anderson, Jas. B. Weida, John Stein, Isaac H. Taylor and H. B. Stewart.

The Ironton Disc Plow Co., Ironton, O., capital $10,000, has been incorporated by Julius I Anderson, W. E. Reynolds, Clarence M. Huner, Edward J. Bird, Jr., and Fred P. Horschel.

The Standard Engineering Co., Cleveland, capital $25,000, has been incorporated by F. A. Tuttle, George L. Wells, A. J. Wells, W. C. Shepherd and Stanley Shaffer.

At Hartford, Conn., W. H. Cochrane, J. C. Bartlett and J. Reitz, Jr., of Pittsburg, and E. J. Lloyd, of Edgewood Park, Pa., have organized the Bartlett Furnace and Range Corporation with a capital of $100,000.

The Brooks Fire Machine Co., Wichita, has been incorporated with a capital of $100,000.

The American Spindle Co. has been organized at Pawtucket, R. I., with a capital of $10,000 to manufacture and sell spindles, machinery and tools. The names of the incorporators are: Edward P. Jastram, Robert L. Ward, Thomas F. Sexton, all of Providence.

The Acme Foundry Co., Detroit, Mich., has been incorporated under the laws of Michigan with a capital of $10,000.

Fires and Accidents:—

The B. & O. car shops, Painesville, O., were completely destroyed by fire on the morning of June 4th. The loss is estimated at $20,000.

In the recent conflagration which visited a part of Racine, Wis., destroying several plants, the damage to the J. I. Case Plow Works was comparatively slight. The main plant was not touched, the loss being confined to a few sheds and contents. Shipments are being made as usual.

The Gainesville Iron Works, Gainesville, Ga., was demolished by the terrific tornado which struck that city June 1st. Several employes were killed.

The Phœnix Car Co.'s plant at Sheboygan, Wis., was destroyed by fire June 5. Loss, $30,000.

New Construction:—

The Seaboard Air Line Railway, J. M. Barr, general manager, will rebuild at once machine shops recently destroyed by fire at Portsmouth, Va.

Dale & Reed, Franklin, Pa., will rebuild their machine shop recently destroyed by fire, and expect soon to be running the same as before the fire.

The Damascus Brake Beam Co., of St. Louis, has purchased two and one-half acres near Sharon, Pa., and will erect a plant at the expenditure of from $50,000 to $60,000.

Work has been begun on the new plant of the Richmond Foundry & Mfg. Co., Point Richmond, Cal. The plant will be 80 x 100 feet.

The Hyle Steel Tool Co., Syracuse, N. Y., whose new plant has previously been mentioned, will erect five buildings. The first will be 40 x 140 feet, two stories high at one end. The rooms of the second story will be used as offices. The remainder of the building will be used for machinery for grinding and polishing. The foundry will be 60 x 100 feet and the annealing building will be 35 x 60 feet.

Callison Bros. & Co., of the Northwestern Machine & Boiler Works, Superior, Wis., have had plans prepared for a new plant which will be erected at a cost of about $100,000.

The Canadian Iron & Foundry Co., Toronto, Canada, has purchased a site of twenty-two acres, and will erect several new buildings to meet the demands of its increasing business.

A large force of workmen is clearing away the debris of the wrecked plan of the Diamond State Car Spring Co., Wilmington, Del. The work of rebuilding will soon be started. For some time the company has been contemplating enlarging its plant, and it is probable that this will now be done.

The Crane Co., manufacturers of machinists' and plumbers supplies, has purchased a seven-story ware house, 16th and Walnut Sts., St. Louis, and will build an additional seven-story building 100 x 120 feet, adjoining the present structure, of the same size. The present quarters of the company, 1213 Locust St., are too small to meet the demands of its rapidly growing business.

The Frank C. Patten Co., De Kalb, Ill., has started work on a new foundry building 200 x 70 feet.

Rapid progress is being made in the erection of the new

plant of the Rome Metal Co., Rome, N. Y., recently capitalized at $200,000. The plant will have its own water system, power plant and electric light plant. Some of the dwellings will be completed this season, and work on others will not be started until next year.

The plant of the Montreal Brass Works in Ste. Cunegonde, Montreal, owned by the Robert Mitchell Co., which was recently partly destroyed by fire, entailing a loss of $150,000, will be rebuilt.

The American Seeding Co. intends to erect a drill manufacturing plant in Ontario, Canada, for the purpose of supplying the Canadian trade with machines. This step was decided upon at a recent meeting of the executive board of the combine, held in Springfield, O. Captain E. L. Buchwalter, president; James A. Carr, vice president and chairman of the executive board, and Frank R. Packham, manager of the improvements and patents department, are in Ontario preparing to establish the new plant.

The Empire Iron & Steel Co., Niles, O., is building an addition 100x150 feet, a steel structure covered with corrugated iron, which will be used for the shipping department and will contain no machinery.

The Kentucky Iron Co., operating a blast furnace at Paducah, Ky., has decided to improve the plant to the extent of about $40,000. A new stove will be built, and new machinery installed.

The Baldt Steel Casting Co. has acquired a site at New Castle, Del., adjoining that of the Brylgon Steel Casting Co. The company will erect buildings at the expenditure of $250,000. A number of open-hearth furnaces will be constructed. Fred Baldt, who has been prominent in the steel casting business at Chester, Pa., for many years, is president of the Baldt Co.

The Waco Street Railway Co., Waco, Texas, is having plans prepared for a new machine shop.

The Stewart Iron Works, Cincinnati, O., is preparing to build a large addition to its plant in Covington, Ky. The plans are for a building similar to the one recently completed, but of larger dimensions.

The new addition to the Watt Mining Car Wheel Co.'s works, Barnesville, O., has been completed and machinery is being installed. The building is 90x160 feet.

General Industrial Notes:—

Arrangements are being made by the Hurwood Mfg. Co., of Southington, Conn., to remove its plant to Bridgeport, Conn. Tools are made by the company, which employs about 30 men. Land has been purchased in Bridgeport for the construction of a plant on a much larger scale than the one now occupied.

The Youngstown Wire & Iron Co., Youngstown, O., recently incorporated, has elected the following officers: President, P. J. O'Neil; vice president, J. H. Wagner; secretary and treasurer, J. J. O'Neil; manager, G. D. Clifford; engineer, T. H. Hyde. The company will manufacture light iron and wire work, bank and office railings, wire and iron window guards, sidewalk gratings and lights, fire escapes, stall fixtures, wire and iron fences.

H. Sofransky & Son, Allentown, Pa., have purchased the Catasauqua and Fullerton Rolling Mills at public sale, the first for $13,000 and the other for $16,000.

The officers of the Eastern Tube Co., Zanesville, O., have appointed the following committee on reorganization: Turner A. Beall, Wm. C. Coffin, Frank M. Lowry, John Hoge, C. L. Bailey, Jr., and John Hampton Bailey. Clarence E. Corbett was chosen secretary. A speedy settlement of the financial difficulties of the company is hoped for.

Patrick Foley and W. L. Wainwright, of Morris, Ill., have sold their foundry to G. C. Rickley, of Ottawa, Ill., who expects to start the foundry and install additional machinery.

Russian file makers recently sent large orders for file making machinery to the Hess Machine Works, Philadelphia.

Four cable picking up machines, for use in the Phillppines, have been ordered by the United States Government from the Lidgerwood Mfg. Co., Newark, N. J.

Transmission machinery, made by the Link Belt Engineering Co., Philadelphia, has been ordered for shipment to South Africa.

Engines built by the Russell Engine Co., Massillon, O., were recently shipped to Japan on an order received from that country.

The Alabama Steel & Wire Co. has announced that it will close its steel rod, wire and nail mill at Ensley, Ala., for repairs this summer, but denies the persistent rumors that it will remove the mill to Gadsden. The company states that the Gadsden steel mill will be in operation by December 31.

The stockholders of the new Havers-Dawson Co., Elwood, Ind., have elected the following directors: D. F. Havens, W. V. Drake, S. H. Digel, W. H. Smith and H. P. Carpenter. The directors elected the following officers: President, S. H. Digel; vice president, W. V. Drake; secretary and manager, F. O. Hodson; treasurer, W. H. Smith; superintendent, T. J. Dawson. The company has rented a building which it will remodel and use this year. It is the intention to branch out extensively next year in the manufacture of cornices and sheet metal products generally.

At Cumberland, Md., J. Philip Roman has been appointed receiver for the firm of Smith & Dreyer, wholesale and retail dealers in machinists' supplies, on petition of Fred Dreyer, junior member of the firm. Conrad Smith, the senior member, has mysteriously disappeared.

The new open hearth works of the Sharon Steel Hoop Co., Sharon, Pa., has been in operation since June 1. The plant is expected to turn out 225 tons of open hearth steel per day, of which 125 tons will be used in the manufacture of cotton ties, steel hoops and bands, the other 100 tons being sold in the open market. The plant is equipped to roll steel billets from 1¼ to 4 inches square.

The city of Grand Rapids, Mich., has purchased $40,000 worth of water pipe and fire hydrants. The American Car & Foundry Co. bid $30.40 per ton on the water pipe and obtained the contract. The other bidder was the United States Iron & Foundry Co. The hydrant contract went to R. D. Wood & Co., of Philadelphia, at $36.60 per hydrant.

The Pneumatic Signal Company's new plant at Lincoln Park, Rochester, N. Y., was placed in operation June 1st. All of the machinery used in the old plant on Green Island, near Troy, was shipped to Rochester. About 500 men are employed at the plant.

After a successful business career which extended over nearly seventy years, the Allison Mfg. Co., manufacturers of gondola and flat cars, Philadelphia, will go out of business within a few weeks. The works were established in a small way in 1835 by W. C. Allison, who died in 1891, when the business had already been incorporated under the name of the Allison Mfg. Co. With Thomas W. Allison, a nephew, as treasurer, the business continued to be managed by Frank R. Tobey, as president, and Harry S. Moulton, as secretary. The latter has recently become associated with a similar concern at Easton, and Messrs. Tobey and Allison are closing the business.

The Long Arm System Co., Cleveland, is now hard at work filling orders for the "Long-Arm" safety electric power doors which have recently been officially approved and specified by the U. S. Government for all its large naval ships now building. Last week, the company received orders for those on U. S. Battleship Louisiana and for those on U. S. Cruisers Maryland and West Virginia building by the Newport News S. B. & D. D. Co. Among the notable orders received during May was one from the Fore River Ship & Engine Building Co., of Quincy, Mass., for all standard navy swing doors and coal bunker trimming doors required for U. S. Battleships Rhode Island and New Jersey. The navy standard swing doors and coal bunker trimming doors for U. S. cruisers Colorado and Pennsylvania, building by the William Cramp & Sons Ship & Engine Building Co., Philadelphia, are now in process of construction in the works. The company is also furnishing the same firm with swing doors required on the Turkish cruiser Medjidia.

Buffalo Forge Co., Buffalo, N. Y., has purchased the plant of the Buffalo Steam Pump Co., North Tonawanda, N. Y. The business conducted by the former owner, the manufacture of steam pumps of high capacity, will be continued on a much larger scale. The old foundry and machine shops of the defunct Gillie & Godard Co., which adjoins the steam pump works, have been secured and will be equipped as part of the big plant.